November · 1957

MPM Metal Products Manufacturing

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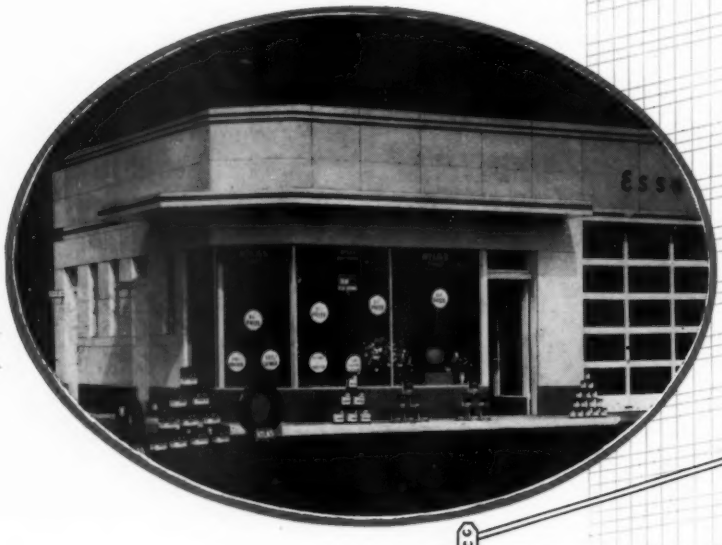
including finish

SERVING THE *Appliance* AND FABRICATED METAL PRODUCTS INDUSTRY

FROM RAW METAL TO FINISHED PRODUCT

It's "Ceramic"

for dependable porcelain enamel colors



for
SKYSCRAPERS
SERVICE STATIONS
SIGNS

Since the time when signs were practically the only outdoor application of Porcelain Enamel, "Ceramic" has supplied colors for leading sign manufacturers. Oil companies were the first to realize that the attention-getting brilliance, the self-cleaning surface, and the lasting freshness of Porcelain Enamel made it also an ideal material for service stations, and "Ceramic" has long been depended on as a reliable producer of colors for them. Now, since Porcelain Enamel has come into its own as a versatile medium for striking architectural effects, "Ceramic" is even more widely known as a supplier of colors that meet the exacting demands for constant uniformity and reliable workability.

WENNING CERAMIC COLORS TRADE MARK

CERAMIC COLOR & CHEMICAL MFG. CO.

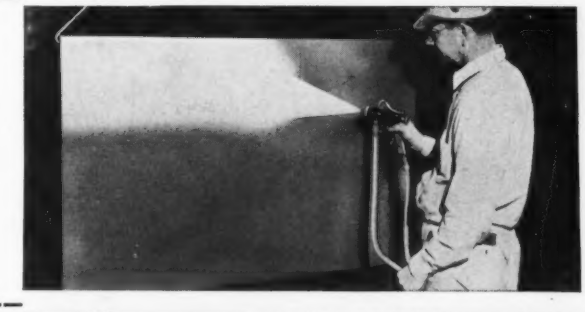
NEW BRIGHTON, PENNSYLVANIA

Armco ZINCGRIP PAINTGRIP Steel... Zinc-Protected, Workable, Ready for Paint

Since its introduction in 1938, Armco ZINCGRIP® PAINTGRIP® Steel has offered all the advantages of a workable steel sheet hot-dip coated with zinc—plus a special mill-Bonderized surface that takes paint immediately, preserves it longer.

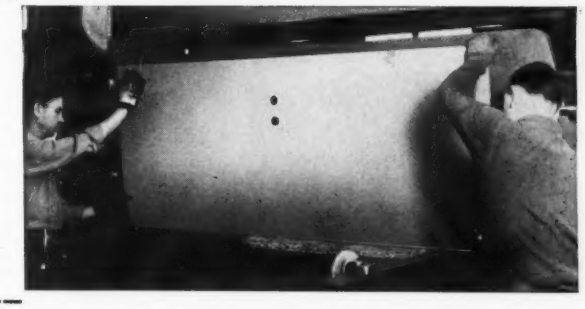
It's Zinc-Protected

A tight coating of zinc, applied to both sides by a special continuous hot-dip process, gives Armco ZINCGRIP PAINTGRIP unbroken protection against rust.



It's Ready for Paint

Parts made from ZINCGRIP PAINTGRIP need no pretreatment for painting. The special mill-applied Bonderized film takes paint immediately, insulates it from the zinc, holds paint longer.



It's Workable

Form it, draw it, work it to the limit of its ductile steel base! The zinc coating and Bonderized film stay intact—will not flake or peel. Parts are as fully zinc-protected, as readily paintable as a flat ZINCGRIP PAINTGRIP sheet.

Perhaps Armco ZINCGRIP PAINTGRIP Steel can help *you* step up sales, hold down costs. Just fill in and mail the coupon for more information about this service-proved special steel for painted products that must fight rust.

ARMCO STEEL CORPORATION
2297 Curtis Street, Middletown, Ohio

Please send me full information about Armco ZINCGRIP PAINTGRIP Steel.

Name_____ Title_____

Firm_____

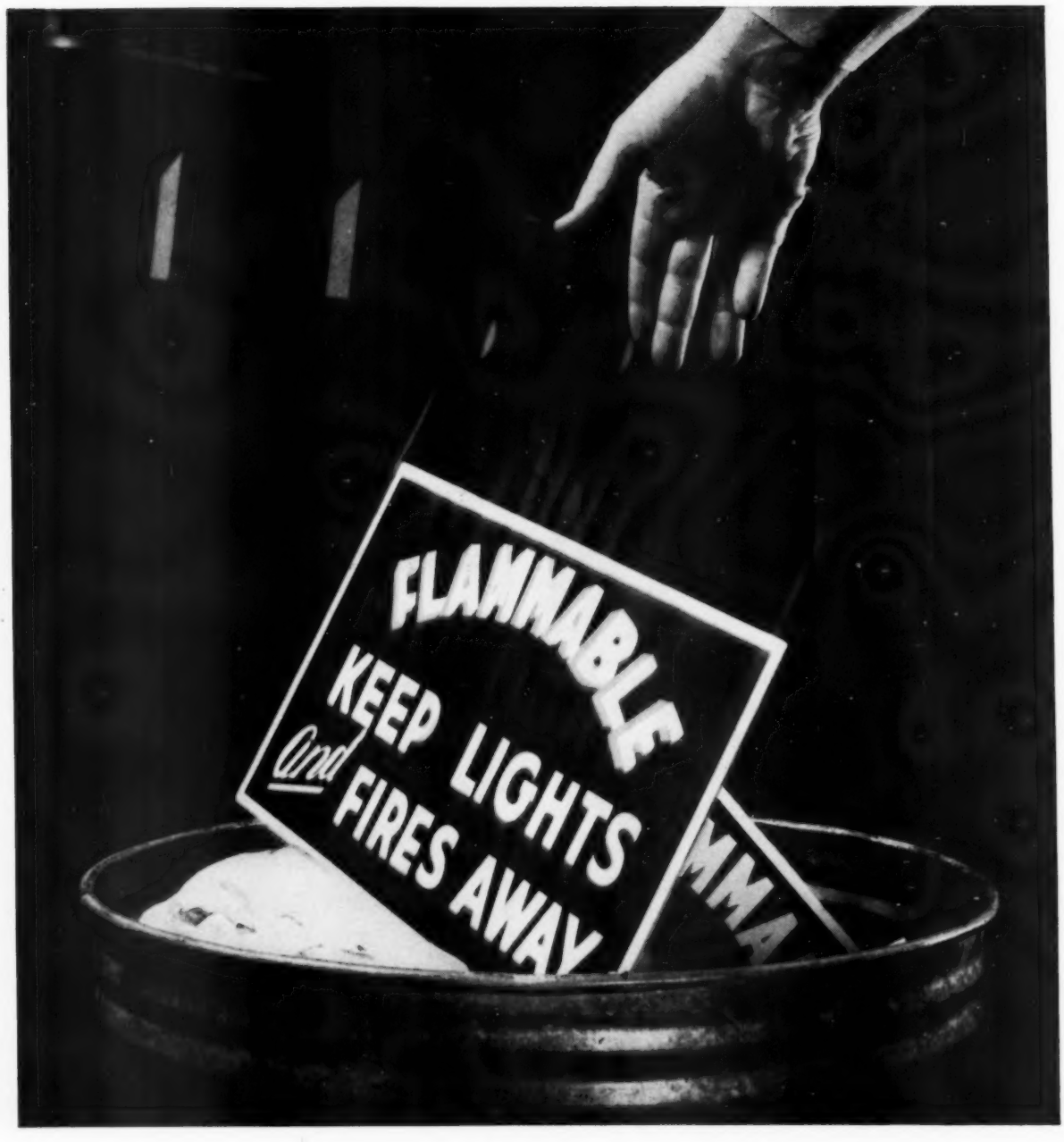
Street_____

City_____ Zone____ State_____

ARMCO STEEL CORPORATION

2297 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



Latex metal paints eliminate fire hazard

Metal paints formulated with Dow latex offer metal fabricators important new advantages. Dow industrial latexes provide the basis for revolutionary new finishes that are eliminating old problems in fire hazards.

When you use latex metal paints you provide safer working conditions and fire insurance rates are lower because water replaces flammable solvents. And, by eliminating toxic solvents, disagreeable odors are reduced to a minimum.

Get in touch with Dow for the technical information you need to take advantage of these revolutionary new latex metal finishes. THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept., **PL1840UU-2.**

LATEX T.M.

YOU CAN DEPEND ON DOW

November • 1957

VOL. 14 • NO. 11

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FEATURES

Page

10TH ARI EXPOSITION TO BE BIGGEST AND BEST EVER HELD 21

SCHEDULING AND CONTROL OF AN ELABORATE PRODUCT MIX
How Hussmann Refrigerator keeps production in line with orders 22

SAFETY IN THE DESIGN OF PORTABLE APPLIANCES
by R. H. Gardner 29

EFFECT OF METAL CHARACTERISTICS ON FORMING AND WELDING
by Lester F. Spencer 33

OPERATING THE WORLD'S LARGEST FLOW COATING MACHINE
by John Sincere 38

26TH ANNUAL MEETING OF THE PORCELAIN ENAMEL INSTITUTE 44

AHLMA'S FIFTH ANNUAL PARTS AND SERVICE CONFERENCE 48

PRODUCTION OF GLASS-LINED WATER HEATERS AT MISSION APPLIANCE CORPORATION
by Gilbert C. Close 57

EDUCATIONAL COLOR-SOUND FILMS TELL THE STORY OF SAFE TRANSIT 87

NST IN ACTION 88

DEPARTMENTS

INDUSTRY MEETINGS 7
EDITOR'S MAIL 14
MPM FOTO NEWS 16
FINISH LINE-EDITORIAL 19
INTERESTING INDUSTRY DEVELOPMENTS 42
NEW PRODUCTS 47
INDUSTRIAL LITERATURE 55
INDUSTRY NEWS 63
INDUSTRY PERSONALS 69
SUPPLIER PERSONALS 71
SUPPLIER NEWS 72
METAL PRODUCTS STATISTICS 85
ADVERTISER'S INDEX 94

METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

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Drawn Aluminum Shells – Brazed Elements

give you added sales features...

improved efficiency...

manufacturing economy

Electric fry pans and other appliances drawn from sheet aluminum with brazed elements are attractive, efficient and economical. You don't have surface porosity to contend with —thus you add the sales points of more attractive appearance and easier cleaning. You add improved efficiency, too, because brazed elements assure fast, even heat distribution.

Reynolds years of experience in drawing aluminum, in forming small dimensional tubing and in brazing to aluminum sheet (in hundreds of thousands of refrigerator evaporators, for example) are good specific reasons for considering Reynolds for drawn and brazed appliance parts. Tremendous fabricating and finishing facilities, quality control from mine to finished part and experienced design and engineering assistance are additional reasons why Reynolds can assure you economical, efficient parts production. For details, contact your nearest Reynolds office or write *Reynolds Aluminum Fabricating Service, 2058 So. Ninth Street, Louisville 1, Kentucky.*

REYNOLDS ALUMINUM
Fabricating Service

BLANKING • STAMPING • EMBOSSING • DRAWING

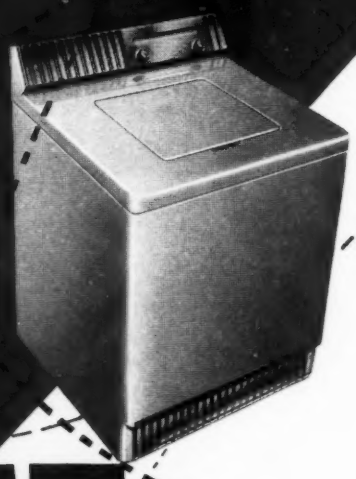
The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

Watch Reynolds All-Family Television Program
"DISNEYLAND, ABC-TV."

The same conveyorized brazing furnaces used to produce tubing brazed to sheet components for every major refrigerator manufacturer are available for brazed parts you require.

Dozens of presses in Reynolds fabricating plants assure low cost, high speed production of drawn aluminum shells for your cooking appliances.

RIVETING • FORMING • ROLL SHAPING • TUBE BENDING • WELDING • BRAZING • FINISHING



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OAT

WCOATING

Primes as it Topcoats

with new IC

Ultraflo*

ONE-COAT ENAMELS

Now you can flowcoat in one coat *without prior priming!* Miraculous, new IC* Ultraflo One-coat Enamels give phosphatised metal a blemish-free, mirror-like finish requiring little or no supplemental spray in just *one* operation! What's more, the high gloss finish has all the corrosion-resistance and durability of a conventional two-step primer and topcoat!

And that's not all! IC Ultraflo One-coat Enamels provide excellent "hang" around edges and holes, instantaneous bubble release, and require minimum time in the solvent chamber. It all adds up to faster conveyor line speeds, and tremendous savings in both material and labor costs.

Perhaps you have felt that *your* product would not lend itself to flowcoating. You'd be amazed at the variety of complex parts with large surface areas that can be successfully flowcoated with IC Ultraflo Enamels! You owe it to yourself to find out. Get in touch with your nearest IC Finishes specialist *today* or send for Ultraflo Bulletin No. 216.

IC® Interchemical CORPORATION

Finishes Division

Headquarters Office: 224 McWhorter St., Newark 5, N. J. Factories: Chicago, Ill. • Cincinnati, Ohio • Elizabeth, N. J. • Los Angeles, Calif. • Newark, N. J. • Mexico City, Mex. • In Canada this product is made by Aulcraft Paints Limited, Toronto, Ontario, and sold under its trademark. **IC and Ultraflo are trademarks of Interchemical Corporation.*

INDUSTRY MEETINGS

HOME LAUNDRY

Eleventh National Home Laundry Conference, Mayflower Hotel, Washington, D. C., November 1-2.

PAINT & VARNISH PRODUCTION

Thirty-fifth Annual Meeting of the Federation of Paint and Varnish Production Clubs, Bellevue-Stratford hotel, Philadephia, Pa., November 1-2.

METALLURGICAL

American Society of Metals' 2nd World Metallurgical Congress, Chicago, November 2-8.

PAINT, VARNISH & LACQUER

National Paint, Varnish, and Lacquer Association's 70th Anniversary Meeting, Washington, D. C., November 4-6.

PEI SHOP FORUM

Porcelain Enamel Institute's 19th Annual Shop Practice Forum, Ohio State University, Columbus, Ohio, Nov. 6-8.

ELECTRICAL MANUFACTURERS

National Electrical Manufacturers' Association Annual Meeting, Traymore Hotel, Atlantic City, N. J., Nov. 11-15.

AIR POLLUTION

Air Pollution Conference, co-sponsored by Armour Research Foundation and Midwestern Air Pollution Prevention Association, Chicago, Nov. 13-14.

REFRIGERATING ENGINEERS

The American Society of Refrigerating Engineers Semi-Annual Meeting, Shoreland Hotel, Chicago, Nov. 14-16.

AIR CONDITIONING

Tenth Air Conditioning & Refrigeration Exposition, International Amphitheatre, Chicago, November 18-21.

STOVE & FURNACE

Canadian Institute of Stove and Furnace Manufacturers Workshop and Annual Meeting, Laurentian Hotel, Montreal, Canada, November 25-26.

INDUSTRIAL ENGINEERING

Industrial Engineering Conference, sponsored by Illinois Institute of Technology, Illinois Institute of Technology Campus, Chicago, Dec. 5-6.

ALUMINUM
PERMANENT MOLD
CASTINGS
ITEM No. 1
ITEM No. 2
STANDARD AND
CUSTOM MADE
Items No. 1 and 2 are standard. Other Griddles for gas and electric ranges are custom made with our exclusive DURAGLAZE or SATIN finishes. They are most popular because they do not discolor easily and cleaning is quick and simple.
Many other styles not shown are available as standard items. Write for full particulars.
MAY WE QUOTE ON YOUR REQUIREMENTS.
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ALUMINUM IN PERMANENT MOLD
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Everglade 4-7171

IBM relies on RANSBURG NO. 2 PROCESS Electrostatic Spray Painting

to get the excellent and uniform high quality wrinkle finish on all

IBM ELECTRIC TYPEWRITERS

IBM's strict quality standards are easily maintained with Ransburg No. 2 Process in the painting of Electric Typewriter parts. Rejects by the former hand spray method used to run as high as 30% on some parts. Now, with automatic Electro-Spray, rejects for all reasons are only 3% to 5%.

Three Times as Many Pieces per Gallon!

Along with increased production, paint mileage is stepped up, and they get three times as many pieces per gallon as by the former hand spray method. That's because efficiency of the Ransburg No. 2 Process Reciprocating Disk puts the paint where it's supposed to go . . . on the parts.

Want to know how Ransburg Electro-Spray can improve the quality of your painted products . . . and at the same time, cut your paint and labor costs? At no obligation to you, we will make complete laboratory tests with your products to prove the advantages and cost saving benefits which can be yours with Ransburg No. 2 Process. Write or call.

Both prime and finish coats are uniformly applied to IBM Electric Typewriter cases as they rotate around the floor-mounted Ransburg No. 2 Process reciprocating disks. Automatic Electro-Spray provides three times as many pieces per gallon as by former hand spray.

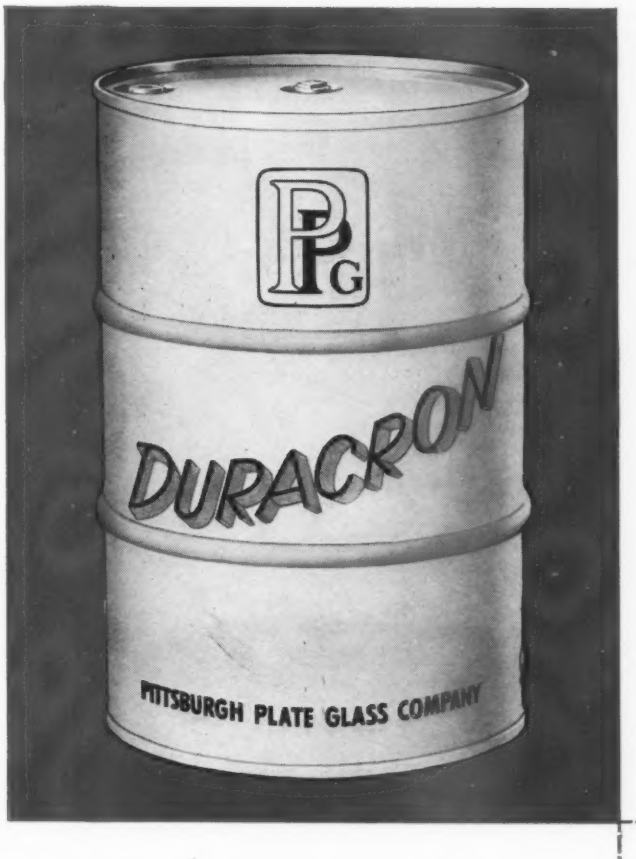
Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

Amazing New Chemical Composition!

DURACRON

Thermo-Setting Acrylic Enamel



Sets a new standard for industrial finishes in toughness, durability and mar resistance!

• **Pittsburgh's new DURACRON** is a revolutionary departure from today's baked enamels. It is a basically new chemical composition developed for the finishing of refrigerators, home laundry equipment, ranges and air conditioning units.

• **It has superior adhesion** to bare metal or primer. It is remarkably tough and durable either as a one-coat enamel or over primer. It retains color and gloss for prolonged periods at temperatures up to 400°F. DURACRON also provides greater resistance to detergents, will not show stains from grease, fruits, mustard, etc. It withstands effects of salt spray, humidity and other corrosive atmosphere. In short, it's a sanitary, taste-free, mar-proof liner for food cabinets.

• **New DURACRON** can also be used advantageously on many other products to improve performance of enamels now used. We'll gladly provide you with additional information. Mail coupon below to Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Pittsburgh Plate Glass Company, Industrial Sales Division, 1 Gateway Center, Pittsburgh, Pa.

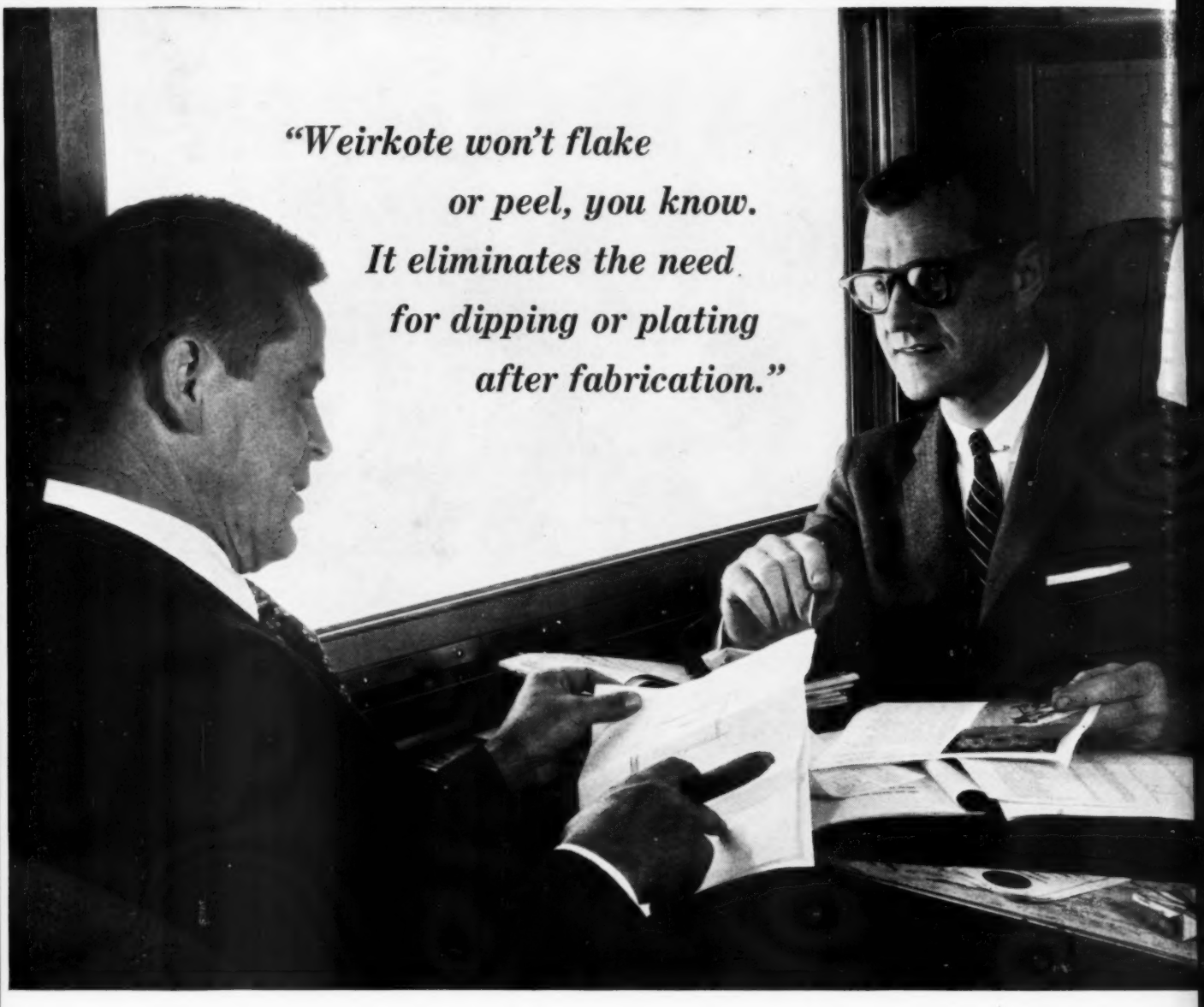
Gentlemen: Please send me additional information about your revolutionary new DURACRON.

Name_____

Company_____

Address_____

City_____ County_____ State_____



Q.—Weirkote . . . name's familiar. A zinc-coated steel, isn't it?

A.—*Yes, but with a whale of a difference. Weirkote is made by the continuous galvanizing process. Not the old pot-dip way. Its zinc coating is* bonded *skin-tight for keeps. And what an advantage that is!*

Q.—We're using an uncoated steel now, and dipping after fabrication. Even then we have trouble getting a 100 percent coating on some of our more complicated parts. Can Weirkote help us?

A.—*You bet—Weirkote's zinc coating stands up under the worst fabrication beating you'll want to give it. Shoot the works—stamping, punching, deep drawing, bending, twisting. Weirkote stays put. Stays uniform. Just won't flake or peel.*

Q.—Sounds like Weirkote may be the answer to a lot of our problems.

A.—*Try Weirkote, by all means. You'll never regret it. Weirkote is one of the shortcuts to economy* and *quality in your business and ours.*

Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. R-2, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

check FERRO first!

It takes much more than *frit* (shown in the molten stage on the preceding page) for satisfactory and *profitable* porcelain enameling operations.

Chemistry and engineering are closely allied in producing this finest of all metal finishes. In getting better adhesion to the metal. In producing thinner, yet tougher coatings. In keeping quality and color consistently uniform. And finally in holding production at a high level—with resulting lower costs so essential today.

If you have questions or problems involving porcelain enamel, it will pay you to *bring them to Ferro—world's only complete porcelain enameling service* . . . including plant layout, furnace design and construction, product design assistance, enamel selection, color-matching service, plant start-up supervision, production trouble shooting, cost analysis field studies, porcelain enameling materials and supplies.

How and when can we serve you?

FERRO

FERRO CORPORATION

4150 E. 56th Street • Cleveland 5, Ohio

Plants in Nashville, Tennessee . . . Los Angeles, California . . . Oakville, Ontario (Canada) . . . 10 other countries

when the time comes...

for new and better glass products — whether it be today or 2000 A.D. — Marsco's craftsmen engineering team will develop them.

The Junior Spaceman above has the best in interplanetary protection — a glass space helmet — because glass can be bowed to fit any desired shape and yet it can be tempered to impart extreme resistance to impact.

You or your family don't need space helmets today but chances are glass could improve the utility and beauty of your product and make it more salable today.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

ask for the man from

Marsco

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

Special shapes for: Instruments, Gauges, Household and Industrial Appliances.

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if you buy
stampings
...look for the
PLUS
beyond
the PRICE!...

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for instance

Ever stop to think how valuable it is to get prompt quotations, reliable scheduling and follow-through, as well as immediate answers to your letters?

It's the natural result of ample personnel working efficiently in modern offices.

You probably will appreciate this *plus-beyond-the-price* fully as much as our present customers.

A chance to quote on your next stamping requirement may well prove it!

A brochure is yours for the asking!

DE-STA-CO

DETROIT STAMPING COMPANY

Established 1915

404 Midland Ave., Detroit 3, Mich.

"America's Leading Job Stamping Manufacturer"

Look to Detroit!

. . . and remember, STAMPING is our middle name

from the Editor's Mail

Salute to special section

Gentlemen: I read the September, 1957 issue of METAL PRODUCTS MANUFACTURING (Sunday night at home), and particularly the "Special Home Laundry Equipment Industry Section." I do this because I find that I can get in more quiet reading of a kind which allows me to study and remember when I read at home, as against at the office.

After reading this, I decided to read it again in a little while, and ever since have been trying to figure out why. I can't just put my finger on it, except to say it left a fine overall impression upon me — in fact, better than was the case in some of the past issues. Maybe your being an expert in this line will know why, but when I discussed this with Guenther Baumgart yesterday, he said he thought this was unusually good.

Thank you for it, and especially for the fine job you did on the tribute paid to our industry.

Bernard J. Hank, President
American Home Laundry Mfrs. Assn.
Chicago, Ill.

Source of information

Gentlemen: In the September, 1957 issue you wrote an article "Plant Modernization Speeds Lighting Fixture Finishing." In it you mentioned that an automatic control system was used for conveyor chain lubrication. I would appreciate it very much if you would tell me how I could obtain further information on this system. We have over 16 miles of conveyor in this plant. Thus, such a system could be extremely useful to us if adaptable.

This was an exceptionally interesting issue for me. I appreciate your magazine's many fine articles, and will be looking forward to the future issues.

Richard F. Schultz
Automation Engineer
Whirlpool-Seeger Corp.
St. Joseph, Mich.

ELECTRIC SPACE HEATING

Right article — wrong author

A once-in-a-lifetime error which has caused many red faces around the editorial department of MPM occurred in connection with the presentation of the article "Electric Space Heating Makes its Bid" in the June, 1957 issue of MPM.

Stuart L. Forsyth, Manager Westinghouse Electric Corporation, Heating for Homes Department, was credited as the author of this article, while the material was in fact prepared by Lowell R. Mast, Director of Engineering of Electro-motive Division, Commercial Controls Corporation, Rochester, New York.

Photographic credit for the illustrations should have gone to Westinghouse, but that was the extent of that company's participation in this feature.

We have expressed our humble apologies to both Mr. Mast and Mr. Forsyth for this inexcusable production error, and we are using this means of informing MPM readers.

values magazine

Gentlemen: The Consulate is interested in your publication and should be most grateful if you could be good enough to forward a complimentary copy. Thanking you for your attention.

Mr. Hesse, Asst. Commercial Sec'y.
Consulate of Federal Republic of Germany
2711 Book Building
Detroit 26, Mich.

Editors' Note: Complimentary copy was sent to Mr. Hesse by return mail.

wants magnetic testing article

Gentlemen: Kindly send me tear sheets of Gerald Barta's article "Magnetic Testing as an Assist to Production Quality Control" which appeared in the March, 1957 issue of MPM. Thank you for your courtesy in the above request.

Stanley J. Klima
Sperry Gyroscope Company
Great Neck, New York

values magazine

Gentlemen: We appreciate receiving this publication. It is passed on to our supervisor of our metal shop and our quality control supervisor.

A. A. Emlen, Chief Engr.
Peerless Electrical Prods. Div.
Altec Lansing Corp.
Los Angeles, Calif.

to Philco Corporation

Gentlemen: I have been receiving your fine magazine for some time and, as I have recently changed positions, I do hope that my subscription can be changed to the new address.

I previously held the position of General Product Manager with the Crosley and Bendix Home Appliance Divisions of AVCO. I have just recently joined the Philco Corporation as Product Manager — Home Laundry Department.

Albert Emanuel, II
Product Manager
Home Laundry Dept.
Philco Corporation
Philadelphia 34, Pa.

extends his thanks

Gentlemen: May I take this opportunity to thank you most sincerely for the write-up given to Hydroforming Company of America, Inc. in the current issue of your excellent book, METAL PRODUCTS MANUFACTURING.

We are looking forward to the pleasure of continued associations.

Herman E. Lacy
President
Hydroforming Company of America, Inc.
Chicago 31, Ill.

"This galvanized sheet takes any operation...

without cracking or peeling the zinc coating...

saving a further 'finishing' operation because...

Wheeling SOFTITE® has the tightest zinc coating yet produced"

What makes Wheeling SOFTITE different from other galvanized sheets? Just ask any manufacturer or sheet fabricator who has tried them.

They'll tell you that Wheeling SOFTITE takes draw, every spin, every tortuous operation without ever cracking or peeling. That's because SOFTITE is ductile, so it's easy to work. At the same time it has the tightest zinc coating yet produced. That's why SOFTITE products look so good, last so long and save manufacturing costs.

If you would like to enjoy all these advantages, make a note right now to try Wheeling SOFTITE Galvanized Sheets.

Call your Wheeling industrial supply distributor, the Wheeling sales office nearest you, or write Wheeling Steel Corporation, Wheeling, West Virginia.

IT'S WHEELING STEEL

WHEELING STEEL

District Sales Offices—Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling

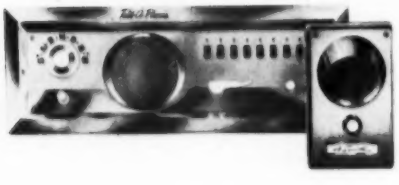
OUR CHALLENGE STANDS: ANYTHING THAT CAN BE MADE OF STEEL SHEETS CAN BE MADE OF WHEELING SOFTITE GALVANIZED SHEETS

the MPM . . .

on the theory that one photo equals o
ture will bring you many photos a

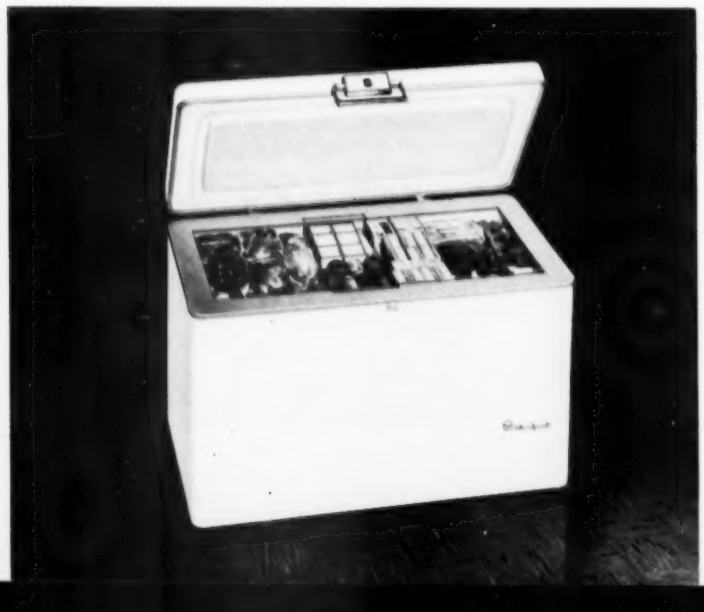
WELCOME TO HAWAII for Lee Stoddard (center), supervisor of field service and training for The Maytag Co., Newton, Iowa, was extended by Kaz Kodoma (left), vice president, and Lee Gray, president of Gray Distributing Co., Maytag distributor in the islands. Stoddard recently conducted service meetings for Hawaiian dealer personnel.

VULCAN CONTAINERS, INC., Bellwood, Ill., steel shipping container manufacturer, has expanded its manufactured line to include production of 55-gallon drums. Herbert B. Scharbach, (left) vice president of sales, and George E. McMahon, executive vice president, examine the first drum to come off Vulcan's assembly line. The firm will continue to produce a wide variety of smaller steel shipping pails, ranging in size from one to fifteen gallons, these executives report.



TALK-A-PHONE Co., Chicago, has announced an all-new, all-transistor home intercom-radio system. Unit can be flush-mounted or surface-mounted, and brings complete intercommunication as well as radio all through the house.

STORAGE CAPACITY for 522 pounds of frozen food is provided in this 15 cubic foot RCA Whirlpool Custom model chest freezer introduced by Whirlpool Corp. Styled with clean, crisp lines to blend with modern kitchen cabinets, the unit has a pink interior finish accented with chrome and charcoal. The cabinet exterior is white baked enamel.

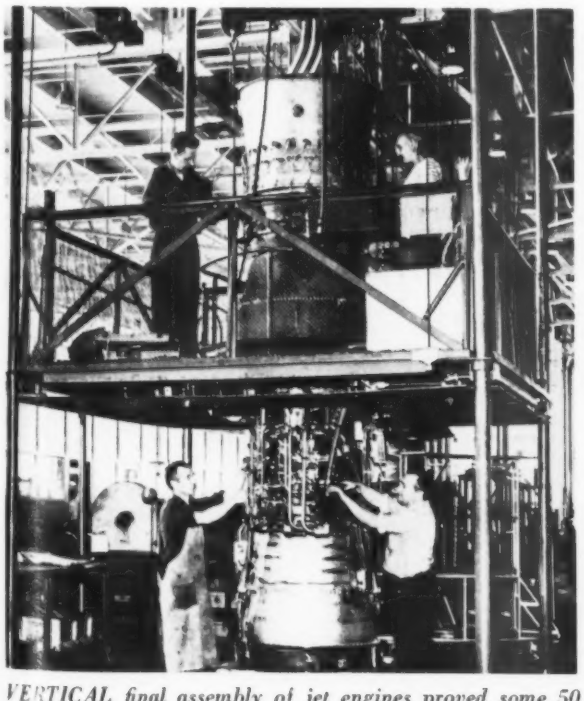


SATISFYING real fresh-brewed coffee, or hot chocolate, is served effortlessly by the Perk-o-fresh coffee vending machine's new electronic lazy-suzan turntable. A morale builder for employees of institutions and factories, the machines are operated by the Interstate-United Coffee Corp., Chicago.

. . . foto-news

**s one thousand words this MPM foto-news fea-
s a new words about people and products.**

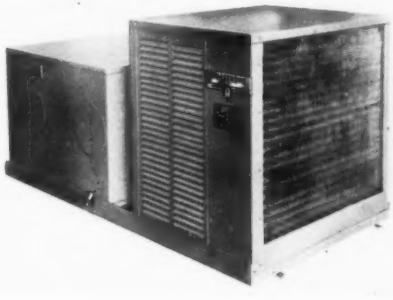
EMBOSSED ALUMINUM panels alternate with stacked panel sections of baked enamel on aluminum, and panels of obscure glass set in satin finish extruded aluminum posts in this sample office installation of E. F. Hauserman's new aluminum movable wall system. The system takes full advantage of the natural beauty and versatility of aluminum, it is stated.



VERTICAL final assembly of jet engines proved some 50 per cent more efficient than horizontal methods, and is accomplished by two crews working simultaneously on the eighteen-foot Pratt & Whitney Aircraft J-57 jet by means of a "four-post lifter" made by the Colson Corp., subsidiary of Great American Industries, Inc.

J. R. RADFORD, Canandaigua, N. Y., (left) receives from E. F. Gallivan (right), the 500th "Wirebound Engineer" certificate conferred by the Wirebound Institute for completing its technical course in the design, specifications, and testing of wirebound boxes and crates. The certificate was awarded recently at the graduation "clinic" of WBI, held at Package Research Laboratory, Rockaway, N. J., as Harry Wolsdorf of PRL looks on.

ARMSTRONG Furnace Company's line of air conditioners include water and air cooled units of two, three, and five-ton capacity. Addition to the line is a split-system installation, and 'Frigipak,' a single unit air conditioner.



SEAPORCLAD curtain wall panels, produced by Seaporcel Metals, Inc., grace the exterior of the Legislative Palace, City of Panama, Republic of Panama. According to Seaporcel officials, there is growing use of architectural porcelain enamel steel panels throughout Latin America.

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	Forecast for any 4 Years After 1951	Actual for 4 Years 1952-1955
UTILITY GAS CUSTOMERS — Normal Growth	3,220,000	3,526,000
LP-GAS CUSTOMERS — Normal Growth	1,100,000	1,500,000
GAS RANGE REPLACEMENT MARKET	14,275,000	4,360,000
GAS RANGE REPLACEMENT MARKET — (Annual Average)	3,568,750	1,090,150

TURN ON THE GAS..... could well describe the admonition being currently expressed by leading gas appliance manufacturer executives to the gas utilities. The four words should not be taken literally — but to mean that additional steps must be taken by the industry to assure greater cooperative effort between the suppliers of gas and the builders of gas appliances. This effort must be in the nature of sales, advertising, and educational programs. Three speakers at the American Gas Association's 39th Annual Convention in St. Louis voiced strong sentiments on the subject.

Future of the gas range

Stanley Hobson, president, Geo. D. Roper Corporation, displayed a "table of progress" which, together with his frank statements of fact, put a vivid picture before AGA members.

Hobson, an active and top ranking executive in the gas appliance industry for many years, showed what gas range replacement sales "should have been" in any four-year period after 1951 — 14,275,000 units (based on a report by an independent engineering firm).

"There was a potential opportunity to secure annual replacement sales of almost 3,600,000 units," said Hobson. The actual performance, however, accounted for the sales of only a few over a million replacement units per year.

"Manufacturers feel that for the first time since the war, industry sales (this year) will fall below the 2 million unit mark. And this despite the fact that our built-in sales will increase about 14 per cent."

To the utilitymen, he said, "In your hands lies the future of the gas range industry and many of the individual manufacturers. Your return to the basic principles of sound, progressive merchandising and hard-hitting advertising and promotion, might well be the means of relieving us of the burden of producing cheap and profitless merchandise. Time, however, is an important element. It's almost a case of now or never."

In no sense did Hobson place the full burden of improving sales on the utilities, but he did make it clear that they dare not watch from the sidelines if the gas range business is to succeed in the future.

The "unconvinced" market

Julius Klein, president, Caloric Appliance Corporation, and retiring president of Gas Appliance Manufacturers Association, covered all of the appliances for the "seven big household jobs" in his discussion at AGA.

"Our future progress", he said, "is reliant not on those who are convinced that gas is best, but on our ability to convince the *unconvinced* . . . whether he be consumer, dealer, or builder. Our competition knows that, and if ever there was an all-out, across-the-board effort to convince the consumer, the dealer, and the builder that gas is not best, that time is now."

In giving his reasons why the gas industry should not underestimate the scope of the "unconvinced" market, he cited the following: "More than fourteen million homes cook with electricity; almost forty-six million homes refrigerate with electricity; over eight million homes heat with electricity; and almost nine million homes are centrally heated with oil. We are convinced that gas is best, but we are not everybody," he said.

"We must face up to the fact," Klein said, "that, present trends continuing, it no longer need be a matter of years before electric range sales catch up to gas range sales . . . it could be a matter of months. . . . .

"Every fact in the book says that we can have a healthier gas range industry. Every fact tells us we can and should be selling a minimum of three million ranges a year . . . but we're leveling off at two million.

"You, the gas utilities," he continued, "are the suppliers of America's prime cooking fuel. We, the manufacturers, are the producers of America's most sought-after cooking appliances. Let's keep it that way."

The retiring GAMA president outlined the responsibilities of both the appliance manufacturers and the utilities in support of the Action Program for Gas Industry Development.

Each utility should: Assume responsibility for developing sales volume of gas appliances in its territory; Encourage and promote the sale in new homes of gas appliances of as high quality standard as justified; Encourage and promote appliance replacement sales; and Assume leadership generally in promoting the sale of top quality appliances.

Each manufacturer should: Do his part in promoting the sale of better grade appliances to builders, architects, and real estate developers; Accelerate the sale of new appliances; Continually upgrade the performance and salability of his products; and Spend more on advertising and promotion.

Is Arkla the answer?

J. C. Hamilton, president, Arkansas Louisiana Gas Company, presented one *possible* answer to some industry problems by describing for AGA members the acquisition of the Servel air conditioning plant and plans for operating it as a subsidiary — Arkla Air Conditioning Corporation.

The utility executive said that gas air conditioning could solve two competitive problems. He pointed up the fact that electric utilities already are cutting into the cooking and water heating business.

"Through development and sale of the electric heat pump", he continued, "they can take a large share of the summer cooling business and along with it the winter heating unless we take steps to prevent it. Gas air conditioning leads to the solution of both of these problems. After the installation of a gas operated central heating and summer cooling unit, the householder is much less likely to install an electric stove or an electric water heater."

According to Hamilton, it is estimated that the manufacture and sale of a minimum of ten to twelve thousand units per year will be required to justify the "large expenditures" necessary to the success of the new company.

Only time will tell whether the Arkla project is to be successful or is to fail, and whether it may presage a trend or represent an isolated case.

It is apparent, however, that at least one gas utility could see the writing on the wall and made plans to do something about it.

Dana Chase

EDITOR AND PUBLISHER

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10th ARI Exposition to be biggest and best in history

Air-Conditioning and Refrigeration Industry to hold show at Chicago's International Amphitheatre — November 18-21 — Public to be invited for one day

ACCORDING to the Air-Conditioning and Refrigeration Institute the 10th exposition of the industry will be considerably larger than the 9th exposition held two years ago in Atlantic City, N. J. At least 94,000 square feet of exhibition space has been taken which is more than 9,000 square feet above the total space taken at the 9th exposition.

Chicago will become the central focal point for the entire air-conditioning and commercial refrigeration industry as seven of the eight trade associations will hold annual conventions and meetings concurrently with the 10th exposition of the ARI. The American Society of Refrigeration Engineers will hold their meeting beginning Nov. 12. These are the associations, their meeting dates and their convention headquarters:

The Air-Conditioning and Refrigeration Institute — Nov. 18-21 — Sherman Hotel.

The Air-Conditioning and Refrigeration Wholesalers—Nov. 16-18 — Morrison Hotel.

The American Society of Refrigeration Engineers — Nov. 12-16 — Shoreland Hotel.

The National Association of Practical Refrigerating Engineers — Nov. 18-21 — Del Prado Hotel.

The National Commercial Refrigeration Sales Association—Nov. 17-19 — LaSalle Hotel.

The National Warm Air Heating and Air Conditioning Association — Nov. 18-22 — Morrison Hotel.

The Refrigeration and Air-Conditioning Contractors Association — Nov. 16-18 — Drake Hotel.

The Refrigeration Service Engineers Society — Nov. 16-19 — Morrison Hotel.

To admit general public

An interesting innovation in the ARI show is that the public will be admitted on the last day of the show to allow manufacturers to test consumer demand by market research.

Attendance at this year's show is expected to top all previous shows according to ARI estimates. R. H. Isreal, general chairman of the Exposition Committee, expects at least 15,000 buyers of industry equipment to attend, including manufacturers, dealers, distributors, architects, contractors, refrigerating and consulting engineers, and others whose economic success depends on keeping abreast of industry developments.

Show heating-cooling units

Attendance at this year's show will be boosted by the fact that many of the more than 250 exhibitors are unveiling totally new lines of equipment, that heating equipment and combination heating-cooling units are being shown by many manufacturers for the first time, and that with heavier emphasis being placed on optimum efficiency for both heating and cooling systems, manufacturers of insulation products are planning displays and demonstrations of insulation designed to cut tomorrow's cooling and heating bills.

In addition to the completely new lines of room and central air-conditioners for 1958 and entirely redesigned heating plants and heating-cooling units, exhibitors have advised George E. Mills, Show Director, that they plan to show new "packaged" air-conditioners for widely flexible use in residential, commercial and industrial installations, new automatic ice making equipment and soft drink dispensers, walk-in refrigerators, completely new compressors and motors, large capacity bulk milk cooling tanks for dairy farms, new copper-deck cooling towers and air-cooled condensers, truck refrigeration systems, new lines of home-freezers built entirely of aluminum, and many others.

Show heat pumps

In addition, the heat pump, a reverse cycle air-conditioner which cools in summer and heats in winter, will be shown in widely diversified sizes — from room-unit size to installations capable of heating and cooling industrial plants and office buildings.

ARI plans big booth

In addition to all the exhibits of parts, equipment, and end products which exhibitors will have on display at the show, ARI plans an impressive booth highlighting the importance of the industry to the nation's health, comfort and welfare, and emphasizing the services performed by ARI.

The ARI exhibit will trace the development of commercial and industrial refrigeration, as outgrowths of the discovery of the refrigeration cycle, and the logical evolution of mechanical air-conditioning from this same development.

At the same time it will delineate the fields in which ARI provides services to the entire industry and will show how the Institute and its predecessor organizations have grown with the industry.

Entertainment for the ladies

Tentative arrangements have been made for entertainment of ladies accompanying exhibitors to the show. The program includes two visits to the radio show "Don McNeill's Breakfast Club", and two theatre parties — one of them to attend the stage presentation, "My Fair Lady", which will be opening in Chicago in November after a smash run on Broadway, and the second to attend the critic-applauded film, "Around the World in Eighty Days."

Scheduling and control of an elaborate product mix

how Hussmann Refrigerator Company masters the problem of keeping production in line with anticipated orders with a minimum of final error

THE planning problem for manufacturing products of great variety in assembly line fashion without knowing what a customer's order will specify is one of the toughest a metal products manufacturer has to solve.

Hussmann Refrigerator, the world's largest commercial refrigerator manufacturer, solved the problem very well. The St. Louis concern did it so well that they found it was not difficult to produce metal foodstore shelving in addition to food refrigerators, condensing units and walk-in coolers, while at the same time keeping production in balance. The almost limitless variety of store shelving produced is proof that such production control works well.

The control staff functions directly under the guidance of W. A. Vormehr, vice president—manufacturing and Adrian Poelker, the production manager. The scope of operation of the control group includes scheduling, production and supervision of all operations from procurement of special parts to checking the accurate filling of a customer's order.

As one of the top executives at Hussmann stated: production control has enabled the company to turn out a refrigerator case, for instance, with unusual specifications, dimensions and in various styles to customer's order within a period of six days. Except for unusual custom orders, an order for a never-before-produced case can be filled within a short space of time because production up to final assembly is planned so that a definite proportion of various components, based partly on previous sales results, has been scheduled in advance.

Projected sales also factor

In order to plan production, future expected sales are also taken into account by the control staff. The first step for the control staff is to compile a proportionate breakdown of products in each separate category (food cases, shelving, condensing units, etc.) based on two factors: one, past sales history, (typical demand of various models) and, two, future sales based on predictions of the sales staff. The latter category includes expected sales of new models yet to be introduced to the food store builders.

Control planning for all but the immediate future is not based on definite orders. The actual customer's order does not come into the picture until final assembly. It is at this point that control planning proves itself.

Second step — coordination

The product engineering department supplies plans and material bills on all products and corrects the material bills whenever major or minor changes are made. After making up a tentative plan for production, based on past and estimated future sales, control determines the quantity of both manufactured and purchased components used in Hussmann products. Control coordinates the production schedule with expected demand and component needs. This phase of planning is carried on approximately six to seven months ahead.

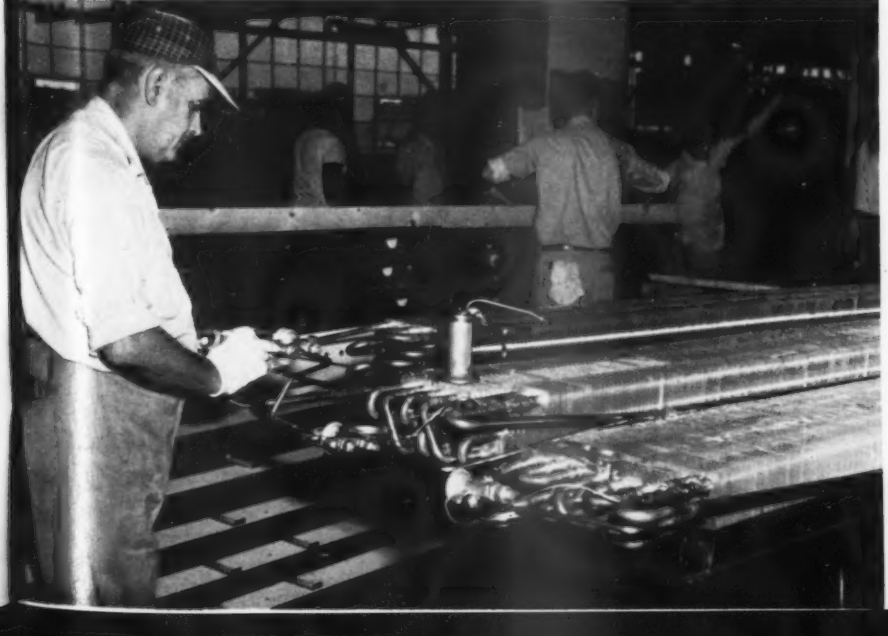
Future sales estimates are made about seven months in advance. Actually, the

Above: This production photograph shows that, after copper tubing is inserted into the aluminum spacers of the cooling coil, water is injected to expand the tubing slightly for a tight, permanent fit.

Left: Many different sizes of compressors are manufactured by Hussmann, either for use with their own equipment, or for other special orders. This is the final assembly line.

MPM PHOTOS

Below: Bottom assembly. Production control schedules each refrigerator in final assembly so that all of the sub-assembled units are in matched sets when the time comes for combining them.



only use to which these estimates are put are to order basic raw materials. These include steel, lumber, glass, to name a few. Suppliers are notified as to the quantities of raw materials that will probably be required. This means that only an informative commitment is made to a supplier — not a final order. Only later, when requirements are more definite, based on actual orders, will final instructions be given to suppliers.

The time for actual procurement of sub-assembled parts and special items such as trim and fasteners is about sixty days before the parts are actually needed.

Moving closer to the scheduling of final assembly the control staff makes up a tentative production schedule. This schedule tells how many of a specific model case will be made on a specific day. Generally the definite scheduling of products this far in advance is done only for products which the control staff is certain will be sold regardless of whether or not an order for these items exists at that time.

From the current date to a date three months in advance, the control staff "fills in the gaps" with definite production-per-day figures. Specific models of cases and the quantities are indicated for production on a specific date.

The major portion of scheduling is done for the ensuing month and very definitely, as can be imagined, for the coming week. If no orders exist for a given model these go toward maintaining a stock build-up of products that sales experience indicates will be ordered.

Because of the constant stock build-up being made from assembly it becomes an easy matter to vary production to insert a last minute or rush order and fill it without much trouble.

Engineering is one of the keys to the myriads of products that can be turned out by Hussmann. Each of the product lines — cases, shelving and condensing units have been designed so that complete interchangeability of sub-assembled parts can be made. Superstructures can also be varied to suit the customer. By anticipating the requirements of store builders, thousands of different varieties of food refrigerator cases, plus the other products, can be produced by Hussmann with little difficulty.

Ninety per cent of the needed parts on cases are stored on the production line ready to be fitted into place, whether for a newly received order or for a previously scheduled stock item.

Parts are also stored on the production line for the assembly of condensing units, shelving and check-out counters. There is not as great a variety of condensing units and check-out counters as there is with store shelving. Proper supply of needed parts is, therefore, a greater problem in the assembly of store shelving. Hussmann has only recently begun the manufacture of store shelving and one reason they have been successful in this field is because production control had the experience to plan efficiently.

Shelving is composed of few large components that require sub-assembly and therefore are assembled on the production line from parts that have been ordered from outside suppliers or made in the plant according to instructions of the control staff several months before. These parts are stored right on the assembly line in accordance with the predetermined schedule.

Control of refrigerated food case final assemby

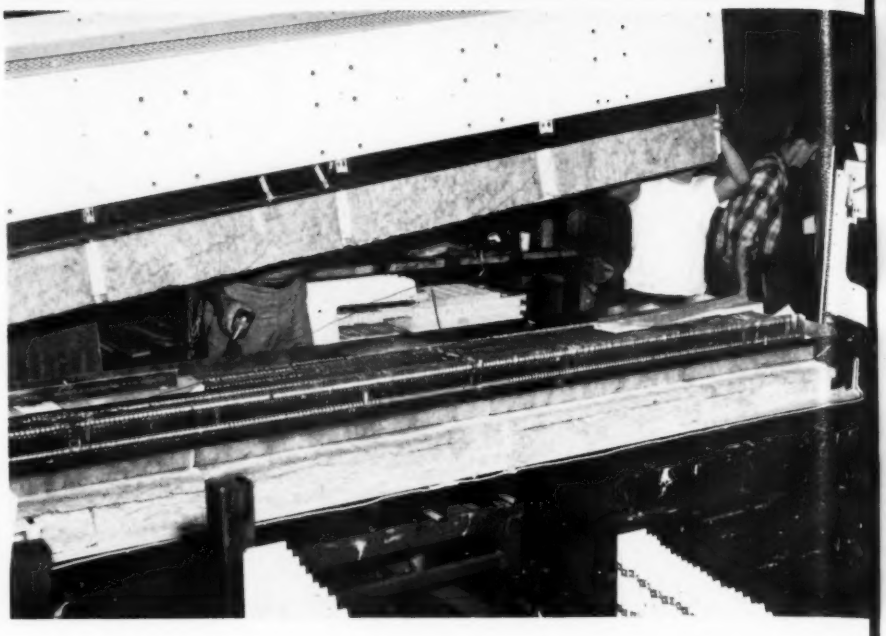
The final task of the control staff in the cycle of scheduling and control of an elaborate product mix is in connection with the actual assembly of products. The quantity of each type of product that is scheduled for manufacture on a specific date must correspond either to definite customer's orders or to a predetermined stock buildup.

A control card made out in quadruplicate specifies the refrigerator model, serial number, factory order number, and any special accessories required for the customer's order. The accessories are identified by material bill number and the model of the refrigerator indicates to the assembly line foreman the basic material bills for sub-assembly.

These control cards are issued daily by the control staff and all assembly is guided by them.

One copy of this identification card accompanies each of the front, back, bottom and coil sub-assemblies. The four copies of the identification card come together as the sub-assemblies are put together on the final assembly line. At the end of the final assembly line the date-completed information is added to each copy of the identification card and the cards distributed as follows: one copy to control department; one copy to accounting department; one copy retained by the assembly line foreman; one copy remains with the refrigerated case until time of ship-

to Page 27 →

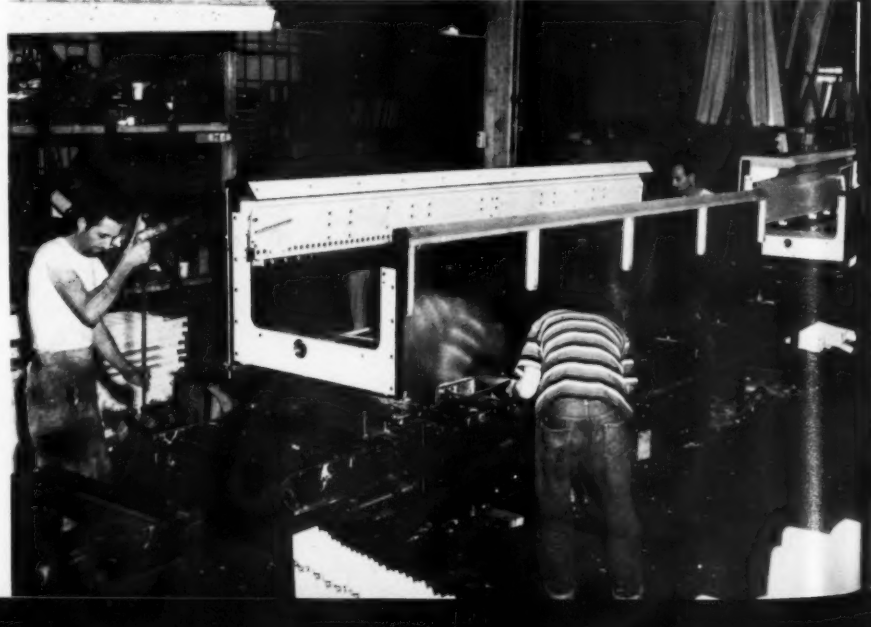


Above: Here, the hoisted upper section of a refrigerator case assembly is being lowered onto a cooling unit base section.

Right: Back assembly. Here the case frame is being sub-assembled along the two sub-assembly production lines. A control card, with complete information included, moves along with the sub-assemblies.

MPM PHOTOS

Below: Having been joined at the previous station, the case now is moved to the final assembly where the final finishing details are added.



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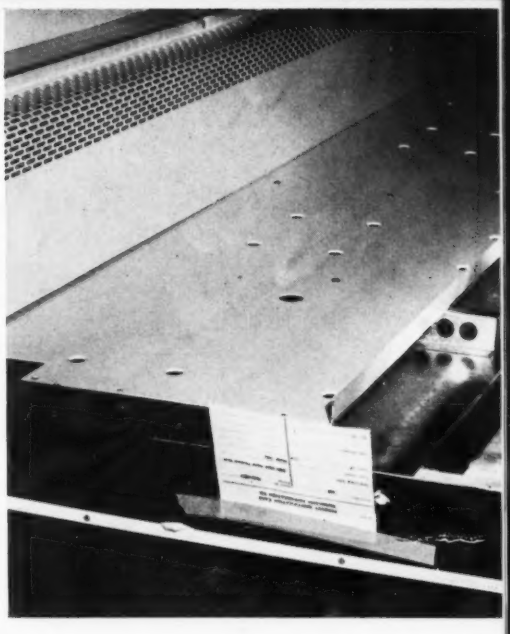
Scheduling and control at Hussmann

(Continued from Page 24)

A TYPICAL STORE REQUIRES THE FOLLOWING EQUIPMENT:

35 cases in 14 models from 83 basic material bills and 154 accessory material bills.
5 coolers in 5 varieties from 70 cooler section material bills and 20 material bills on the fittings and trim.
18 condensing units in 12 varieties from 54 material bills.
100 sections of shelving consisting of 16 assembled parts per section. The variety of shelving parts in a store would be approximately 70.
6 mechanical check-outs involving 15 different material bills.

ment. At time of shipment the following information has been added on this "shipping" copy of the card: The date crated; the crated weight; and the date of shipment. When the case is shipped this card is returned to the control department for the purpose of completing the department records.



Right: This is a closeup of one of four identical production control cards. After inspection, one card goes to accounting, one to the warehouse, and two to the control department.

Production facilities

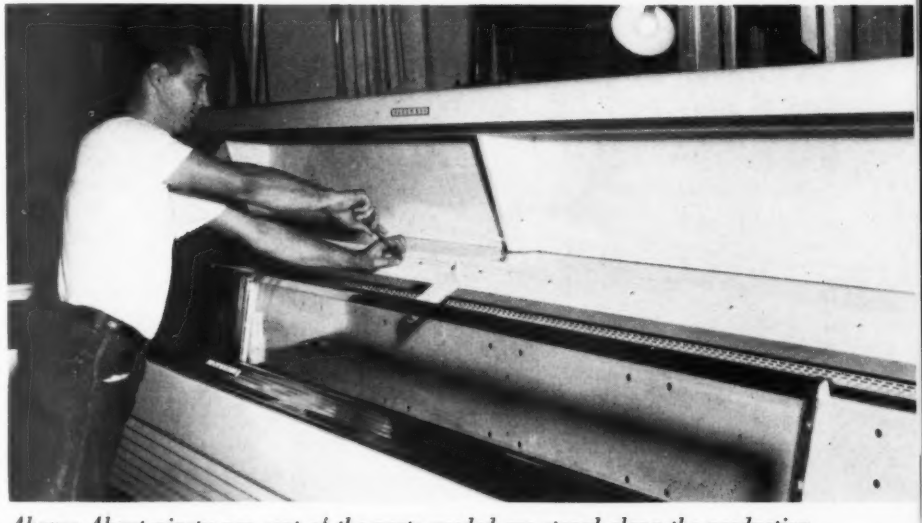
Within the past few years Hussmann Refrigerator has opened an entirely new plant in a separate location in St. Louis. The new facility houses the manufacturing lines for shelving, walk-in coolers, accessory kits, condensing units, and the raw materials and finished goods warehouse. Basic fabrication is also handled at this plant for each of these lines. The latest production methods and equipment are employed in this new plant. For instance, the paint spray line is a new electrostatic unit of very high capacity. The installation of the latest types of equipment has resulted in greater capacity per floor area and better final finish over older methods of production.

The main offices and the production of refrigerator food cases are housed at the company's original St. Louis location. About two years ago the entire assembly line for the food cases was revamped and the result was increased production in the same floor area.

Four conveyor lines are used for assembly of the cases from the simplest sub-assemblies to the inspected case. Three of the conveyor lines travel in the same direction with the basic sub-assembled components: the refrigerator coils and its related assembly on one conveyor, the back section on another, and the front section on the other conveyor line. As each of these lines move, sub-assembly is accomplished until the three sections are ready to come together as one unit.

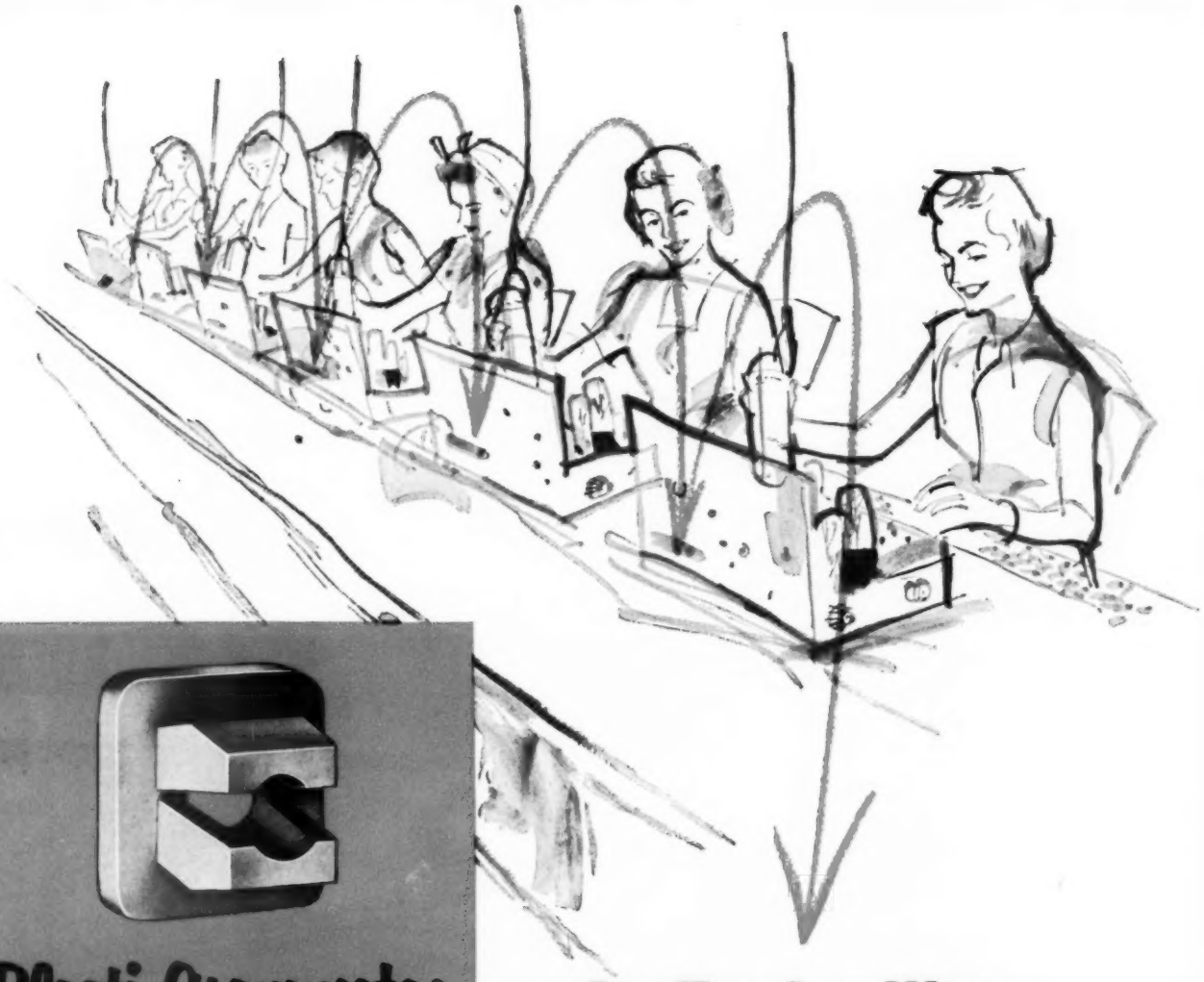
Part of the task of the production control staff is to see that these sections

to Page 94 →



Above: About ninety per cent of the parts needed are stored along the production line for easy access. Here, the moulding is being applied.

Below: Up to a dozen refrigerator cases can be shipped with this specially-designed trailer rack. Larger cases have been shipped by this method with minimum damage.



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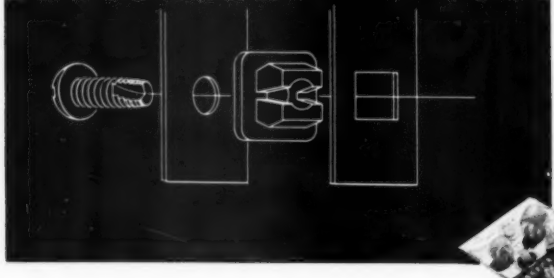

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Safety in the design of portable appliances

the basic problem, electric and mechanical safety, and illustrated examples of properly-designed products.

by R. H. Gardner • THE HOOVER COMPANY

OBVIOUSLY there have been cases of appliances which are either unsafe, or potentially unsafe, having been placed in the hands of the user. Such cases may have been few and far between, but when they have occurred they have seldom failed to make the newspaper headlines. Even though the chances of an unsafe appliance reaching the user may be one in a million, let us concede that appliance engineers are remiss in their obligation if they do not act to improve this condition.

It has been suggested that the electric appliance industry needs more safety standards and specifications to insure the quality and safety of its products. We already have the National Electric Code, various Underwriters' Laboratories Standards, and numerous others. Do we need more? The design engineer would appreciate guidance in determining how to develop a safe appliance, but he could be stifled by rules and regulations — especially when they fail to recognize the new and better engineering materials that are becoming available almost daily.

Whether safety in appliances is achieved *because* of standards and regulations, or *in spite of them*, need be of little concern to the designer. Safety must be designed into the product. The basic problem, therefore, is not why, but how to achieve safety in design. Or, perhaps, how to recognize a safe design once it has been achieved.

Safety matter of degree and judgment

Safety, when applied to portable appliances, is not defined positively or adequately by a dictionary definition. It is a matter of degree and judgment. Safety, when applied to electric appliances, can be considered to fall into two categories: electric safety, and mechanical safety. While these are certainly interdependent, they may be discussed separately.

Any portable appliance can be a hazard merely because it possesses mass, generates heat, or has sharp edges. An electric iron stored on a shelf possesses sufficient potential energy to do serious damage should it fall. An electric fry pan or a toaster can inflict a serious burn on a careless user. The beater blades of a food mixer can chop fingers as well as cake batter.

We can hardly expect to achieve an appliance immune to the careless handling of the user. But the design engineer can avoid potentially-hazardous arrangements. For example, the heel rest of the electric iron can be fashioned so that the iron is stable when stored on it. The supply cord can be placed so it enters the iron without interfering when the iron is placed in the rest position. The handle of the iron can be positioned and shaped so it can be grasped easily and without an awkward twist of the wrist being required to shift the iron back and forth from the ironing to heel rest positions.

The bread toaster can be equipped with convenient carrying handles enabling the user to transport it safely while hot. It can also include sufficient thermal insulation to limit to a considerable extent the temperature of external parts. The switch of the food mixer can be located so that it is not easy for the user to trip it accidentally. The switch itself can have positive detents making it impossible to energize the food mixer accidentally as by dropping it or shaking it. There is no limit to the number of ways in which safety in design can be realized by a competent design engineer.

Appearance design or styling of appliances is not usually associated with safety but, since it establishes the shape and location of the various components of an appliance, it can be most important.

Proper arrangement of parts

Shown in figure one are two vacuum cleaners, one a product of the 1930's; the other an example of modern styling. The older cleaner was considered a good design in its day. It was solidly built and able to give years of trouble-free service. But notice the handle control mechanism. The stamped metal sector was a sound enough design functionally, but it was a hazard to a few small chil-

Fig. 1

Modern Styling

Styling of the 1930's

Fig. 2

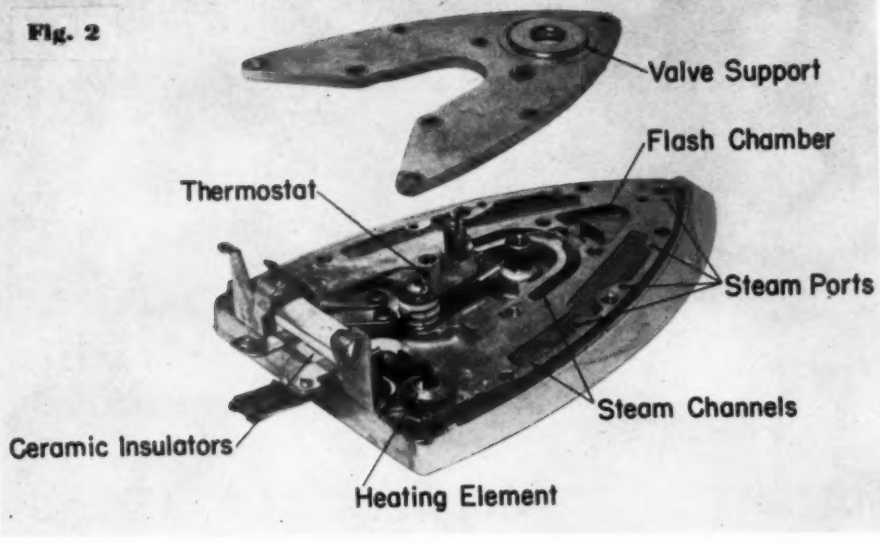
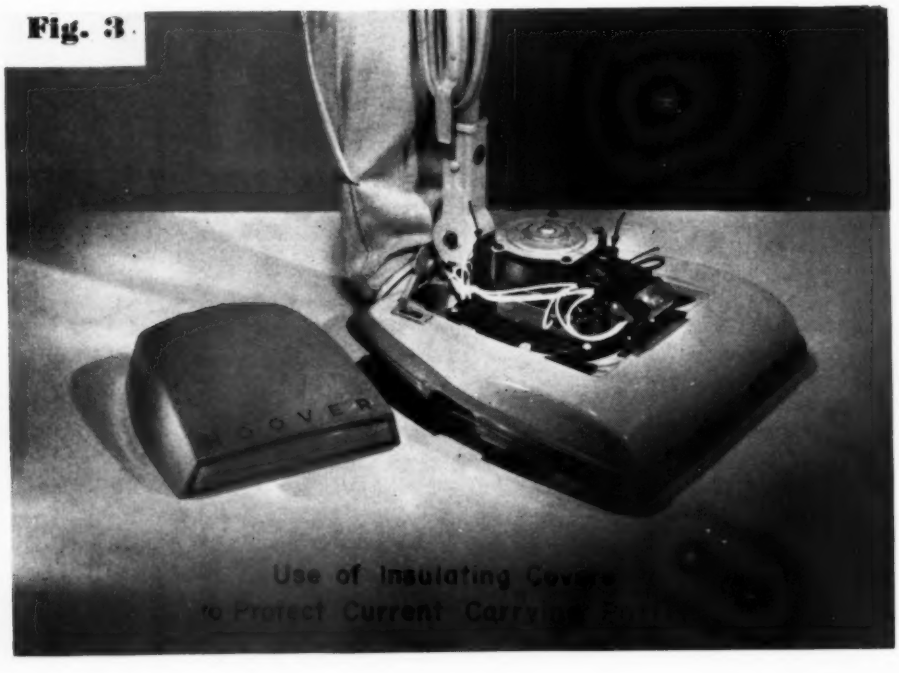
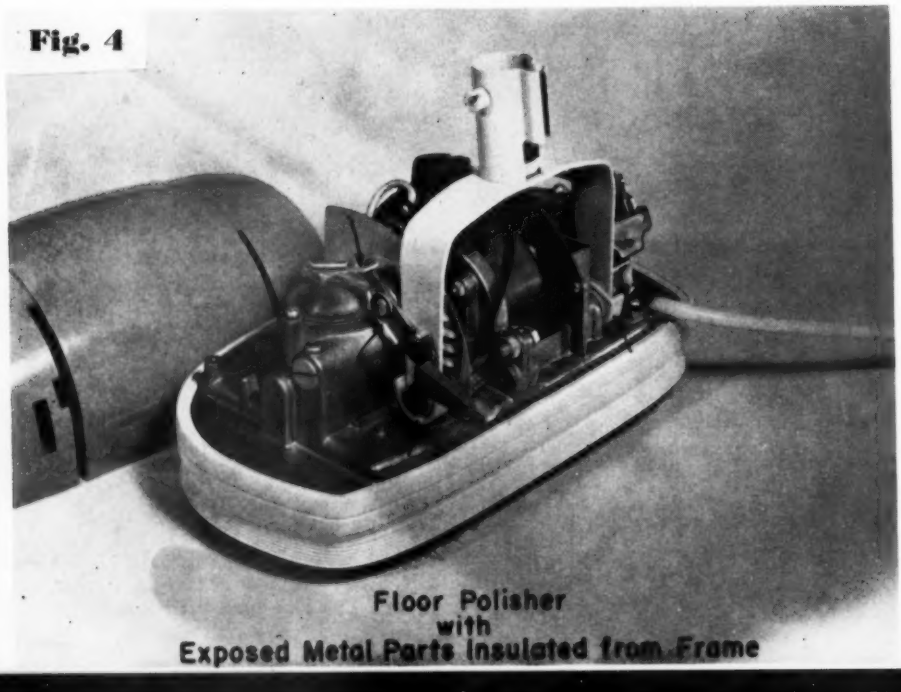


Fig. 3



Use of Insulating Covers to Protect Current Carrying Parts

Fig. 4



Floor Polisher with Exposed Metal Parts Insulated from Frame

dren who caught and damaged their fingers in it. In the modern vacuum cleaner this hazard was avoided by the styling arrangement which required that the handle control mechanism be located where it can neither be seen nor reached easily by children.

The obvious approach to a safe, reliable design is proper selection of materials and arrangements of parts. Electric conductors should be insulated properly and anchored securely. All components should be sufficiently heat resistant and physically strong enough to last the normal life of the appliance without premature failure. Electric conductors should be positioned so they will never be contacted by moving parts. These factors are so self-evident that it hardly seems necessary to mention them. However, unsafe and potentially-hazardous appliances do exist today. Perhaps engineering designers are sometimes guilty of that human frailty of taking the obvious for granted.

Steam iron design

Figure two shows the soleplate assembly of a steam iron. It is presented here as an example of a design in which safety and durability were achieved by the proper selection of materials and arrangement of parts. The electric conductors are bus bars shaped to provide adequate clearance to adjacent non-current carrying metal parts and securely fastened in place. The ceramic insulators which trap the rear ends of two of the bus bars are secured by a U-shaped steel bracket. This mounting arrangement prevents the ceramic parts from being subjected to forces which might break them.

Mechanical-type hazards which may befall a user of a portable electric appliance are usually apparent, and are avoided if the user exercises a reasonable degree of care. Electric-type hazards, however, are insidious. There are no sharp edges or moving parts to give warning. The electric energy is poised and ready to inflict a painful burn without warning. Safety from electric hazard, therefore, can be assured only by proper design of the appliance.

Freedom from electric hazard is achieved in an appliance by using suitable insulation, and by protecting bare electric conductors so they cannot be touched by the user. The chief problem is to determine just what insulation is suitable.

Avoidance of shock hazard

The vacuum cleaner, shown in figure

to Page 77 →

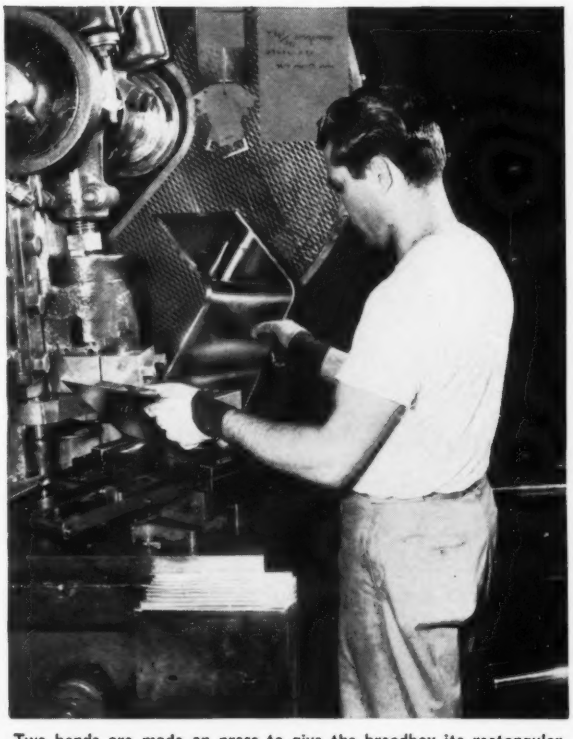
Production Takes A Short-Cut

With Pre-Plated NICKELOID METALS

Sheet of Nickeloid chrome-steel that will be used for breadbox is blanked, with punch-out perforations for ventilation and indented shelf supports. Uniform pre-plated finish reduces rejects.

Edges of Nickeloid chrome-steel sheet are turned up 1/2" in forming press. Nickeloid is easily worked with standard methods.

Breadbox body frame is spot welded to the preformed bottom and back pieces, with no visible oxidation. Parts then move to assembly.



Two bends are made on press to give the breadbox its rectangular shape. Operation causes no marring of surface or dulling of finish.

No Cleaning or Post-Plating — Easily Worked With Standard Production Methods

No cleaning solutions, plating tanks or polishing wheels on the production line at Lincoln Metal Products Co., Brooklyn, N.Y., manufacturer of fine pantryware. Lincoln eliminates these costly intermediate steps by using Nickeloid pre-plated chrome-steel and copper-steel. These versatile design materials speed trouble-free production, reduce rejects, prolong tool life. They are readily worked with standard production methods, as shown here. Parts move from fabrication — to assembly — to packing, with no dulling or marring of the pre-plated finish, since Mar-Not protective covering is used. No cleaning, plating, polishing is needed. Nickeloid Metals are available in pre-plated finishes of chrome, nickel, copper or brass on steel, zinc, copper, brass and aluminum. Sheets, strips, coils — a wide range of finishes and patterns.

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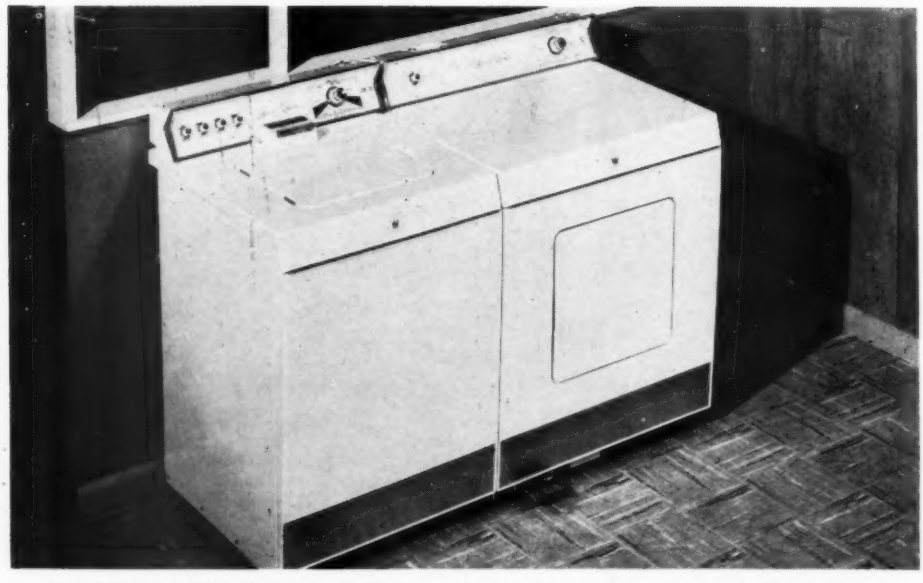

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Effect of metal characteristics on forming and welding

includes the more important aspects of specifying carbon sheet and strip, and clarifies the limitations of the metals for fabricating operations

by Lester F. Spencer • METALLURGICAL ENGINEER

PART TWO: WELDING PROCEDURES

PHOTOS COURTESY SCIAKY BROS., INC.

MPM EXCLUSIVE FEATURE

IN THE FABRICATION of relatively-light gage material, there are a number of welding procedures that are adaptable among which would include gas, inert arc, and the various methods employed in resistance welding. Of immediate interest are those methods of resistance welding since they frequently form an integral part in the completion of a product. Resistance welding is identified with the forming of a joint by the passage of an electric current which supplies the required heat by the resistance offered by the parts to be joined, the current application being used in conjunction with mechanical pressure. It differs from fusion welding in that no filler rod or flux is employed to form the weld.

Due to the fact that both heat and pressure along with the timing of these two variables must be accurately controlled, satisfactory results can only be obtained by the use of equipment that is properly designed for the work. This method, which would include spot, projection, pulsation, seam, and flash or butt welding, has one outstanding characteristic in its rapidity of operation; individual welds being made in seconds or fractions of a second.

Where resistance welding procedures are employed to join component parts,

Projection welder of type used considerably in joining the carbon steels.

Table 4 Suggested Projection Dimensions for Various Stock Thickness (9)

STOCK THICKNESS	HEIGHT OF PROJECTION		DIAM. OF PROJECTION		TYPE
	MAX., In.	MIN., In.	MAX., In.	MIN., In.	
0.015 in.	0.010	0.008	0.062	0.046	Dome
0.031	0.020	0.016	0.125	0.109	Dome
0.046	0.030	0.028	0.156	0.140	Button
0.062	0.040	0.038	0.187	0.171	Button
0.078	0.045	0.040	0.203	0.187	Button
0.093	0.050	0.045	0.218	0.203	Button
0.109	0.055	0.050	0.234	0.218	Button
0.125	0.065	0.060	0.250	0.218	Button
0.156	0.078	0.068	0.281	0.250	Button
0.187	0.094	0.084	0.312	0.281	Button
0.218	0.109	0.099	0.343	0.312	Button
0.250	0.125	0.115	0.375	0.343	Button

it is essential that the parts joined be designed to obtain the maximum benefits of the procedure chosen. Thus, the resultant weld should be of high quality produced with a minimum of cost. The elements of proper design and procedures, as suggested by the Resistance Welding Manufacturers' Association, is given thus.

Spot Welding — In spot welding, the bonding action occurs at a localized point, a spot approximately ¼ inch in diameter. Two pieces of metal are placed together, flat surface to flat surface, and clamped under pressure between the tips of two electrodes. High amperage current is passed between the electrodes with the heat required for welding being produced by the resistance of the material. The factors of importance would include electrode tip size, edge distance of weld, contacting overlap, spot spacing, and electrode clearance.

The size of the spot weld is controlled primarily by size of electrode tip which in turn influences the strength of the weld in shear. As the tip diameter is influenced by the gage thickness, the formula for determining this tip diameter would be $(0.1 + 2t)$ where t represents the thickness of sheet.

The minimum edge distance, which is the distance between the edge of the weld nugget to the nearest point on the edge of either sheet, should be sufficient to allow enough metal all around the spot to retain all of the fused metal in place, and prevent expulsion of metal at the edge. This factor of design is frequently determined by experimentation; however, the value of 4 to 6 times the thickness of material used may serve as a useful guide. Since edge distance is a function of overlap, which is the distance, "L", of typical joint designs as illustrated in Fig. 4, this value is critical in obtaining a high strength joint. It is usually recommended that this value be equal to the diameter of the weld nugget plus twice the minimum edge distance.

Spot spacing is another factor that is of importance to obtain satisfactory strength. If succeeding spots are too close, a portion of the welding current will be shunted through previously produced welds. Thus, a frequent error is the placement of too many spots in a restricted area. Obviously this occurs in roll spot welding, but in this instance, the current supply is increased automatically as the welding progresses to compensate for the power loss realized by the shunting action. This spot spacing is applicable not only to spot welds made in a single row, but also spot welds that are made in adjacent rows.

Although there are hundreds of special horns and electrode shapes available to produce spot welds in awkward areas, these are usually high in cost. It is far better to avoid this condition by modifying the design so that sufficient flange is available to employ standard tip designs. A clean surface is required for spot and other welding methods since contaminants will effect contact resistance and electrode maintenance.

Projection Welding — The more common types of projections that are used in the welding of sheet metal is given in Fig. 5. The dome type projection is generally used for materials that are below 0.031 inches; this design favors the retention of the projection while it is under pressure. The button projection is preferred for the welding of flat stampings above 0.031 inches in thickness; this type projection should be spaced far enough apart when used in multiple so as to prevent the previous mentioned shunting difficulty and low die life due to overheating. The elongation projection is used to a considerable extent on curved sections to obtain the proper contact. It is always desirable to start with a point of contact from which the weld may grow. Shoulder, radius, projections on bolts and nuts, and ring projections are used in specialty applications; the ring projection being quite popular for joining screw machine products and drawn sheet metal parts. Ring projections should be kept away from outside edges so as to allow sufficient space for metal flow.

There are several essential rules that should be followed in the design of projections which are listed as:—

(a) For a given thickness of stock, there is an optimum height and diameter of projection which should be carefully followed;

(b) If the projection height is increased over the specified height, the metal at the edge of the projection is greatly weakened, resulting in an inferior weld;

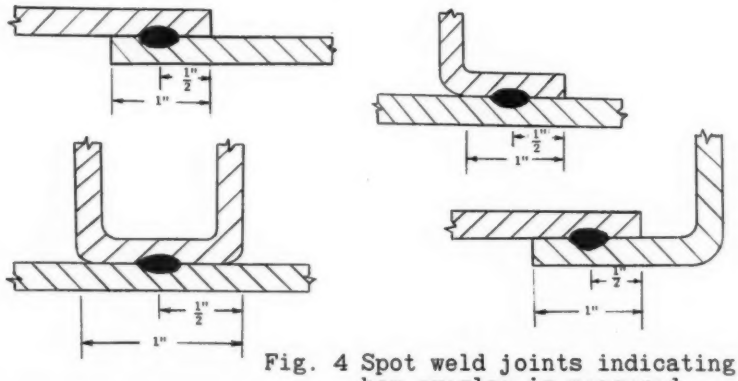


Fig. 4 Spot weld joints indicating how overlap is measured.

(c) If the projection diameter is greatly increased over the recommended value, the current is proportionally increased, and the current distribution is difficult over the whole area, resulting in poorer welds than if the correct projections were used; and,

(d) If projections are multiple and welded simultaneously, the projections should be on the same plane.

Projection welding is used to a considerable extent in joining the carbon steels; recommended specifications for dome and button projections being given in Table 4. Since there are so many variables involved in this type of welding, as exemplified by stock thickness, size and number of projections, throat area, etc., the values for the time of current application and the pressure required are hard to estimate and usually requires preliminary work. However, pressure and follow up are very important in projection welding. In projection welding light gage to heavy, the projection diameter and height are in accordance with that recommended for light gage material. If heavy gage material is welded to light gage, the projection diameter is in accordance for heavy gage stock, whereas, the projection height is that recommended for the light gage stock. An ideal projection should collapse without splashing between the sheets; the two surfaces being in intimate contact before welding.

The low carbon steels are adaptable for both spot and projection welding; the inherent strength and adaptability to forming operations will permit a variety as to size, shape and location of projections. Usually a great variety of assemblies can be welded with but minor changes in the electrodes or dies. Projection welding is not usually recommended for stock that is less than 0.015 inches in thickness since the projections in extremely thin materials may collapse under pressure. The dimensions of the projections employed should be checked since this factor is frequently the cause in obtaining welds of the required size.

Seam welding of liner bottom; this being a component part for a deep freeze appliance. A single operator welds 250 of these large units per day.

Seam Welding — This method of welding is actually a series of overlapped spots where the overlapping is controlled by the timing and the speed of the rollers. If the spots are not overlapped sufficiently to produce a gas tight

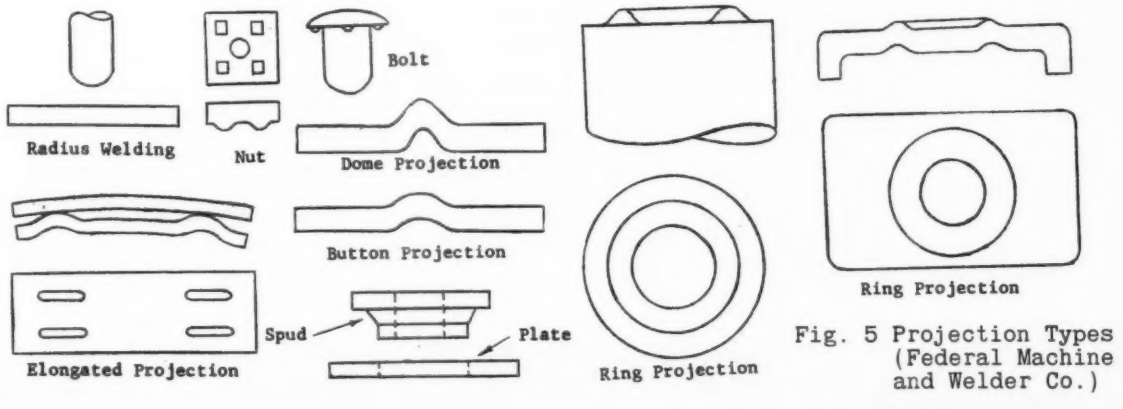
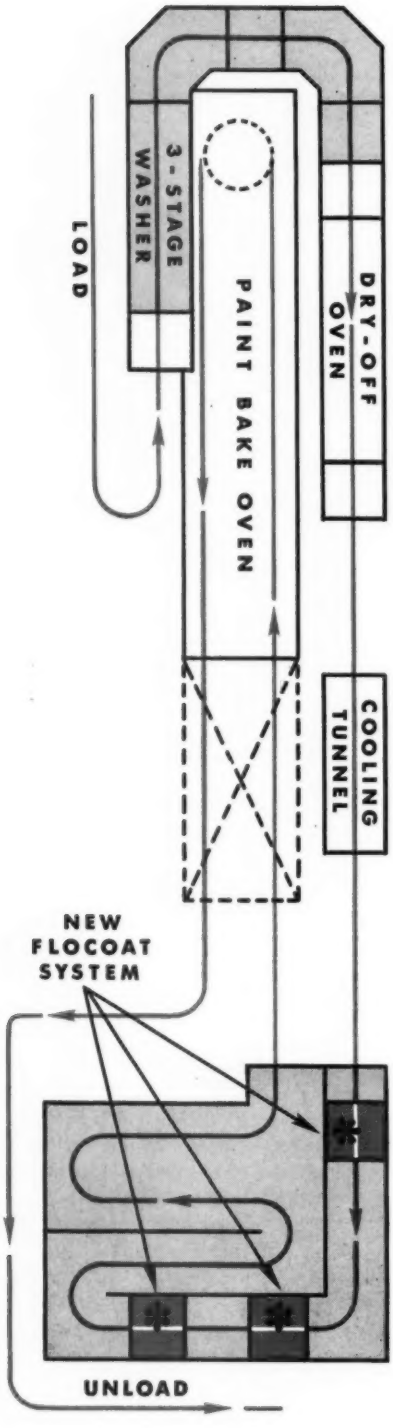


Fig. 5 Projection Types (Federal Machine and Welder Co.)



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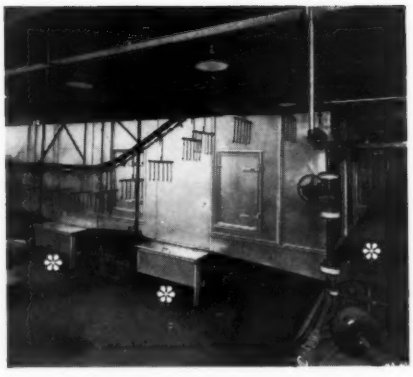

This system was specially engineered by Burdett Engineers to provide automation in multi-color paint applications in the plant of the Douglas-Fisher Corporation in Bellwood, Illinois, manufacturers of tubular metal furniture.

This complete finishing system by Burdett features a new concept in Flocoating with a 3-color system that provides color change in approximately five minutes.

This system consists of 750 feet of No. 348 conveyor, variable from 4 to 12 FPM; a 3-stage washer; a 25' dry-off oven heated by Burdett No. 10-L Burners, providing a heat range from 200° to 450° F.; a 15' cooling tunnel; a Burdett *3-color* Flocoating System; and a Burdett 2-Pass "A" Type "Radiant Heat" Paint Baking Oven with a range from 200° to 425° F. Operating at 325° F. on current production, the total baking cycle is approximately 8 minutes.

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joint, the process is known as "roller spot welding". The "mash seam" weld, which is particularly adapted to the welding of low carbon steels, is used to a considerable extent for refrigerator cabinets, stoves, and many porcelain enameled applications.

The design of assemblies should be carefully checked for work clearances, since there is a definite advantage in the use of standard wheels and arms. The wheel face width of the small wheel electrode determines the width of the weld; this factor being dependent upon (a) the thickness of stock to be welded, and (b) the type of current timing used, i.e., whether it is interrupted or continuous. As the thickness of stock increases, the wheel width is also increased so as to avoid excessive unit pressure and unit current density. The electrode material should have at least 75 percent conductivity, a hardness of Rockwell B76, a tensile strength of 55,000 psi, and an elongation of 15 percent. Normally, the width of the weld will approximate 80 percent of the wheel width.

The lap employed in standard seam roller spot welding should be at least 6 times the thinnest gage employed. In mash seam welding, this lap may be 1½ times the thickness of one sheet. In addition, weld wheel width for mash welding should be 2 to 2½ times greater than that used for standard seam welding while the pressure should be about 3 times greater. The maximum mash weld thickness should not be more than 25 percent greater than single sheet thickness. Both the lap and flange type joint can be employed in lap seam and roller spot welding in a variety of thicknesses; however, the lap seam employed in mash welding is usually restricted to thickness up to 0.062 inches.

In longitudinal welds, tack welding is normally employed to avoid spreading of the lap; however, this can be eliminated by the use of clamping fixtures. The cooling water should be as cold as possible, abundant, and directed onto the weld area; this functions to improve weld quality, retard both wheel wear and warpage, and minimize both surface burning and pick-up on the wheel electrodes. To provide a temporary rust inhibiting action, a 5 percent borax water solution can be employed.

The welding speed, spots per inch and the timing schedule are dependent upon each other which makes it necessary to establish two of these variables before the third can be determined. Since the spots per inch value follows a definite relationship to the thickness of stock, this variable should be the first to be established; the spots per inch increases as the thickness of stock decreases. Thus, in order to obtain gastight welds, 11-gage cold rolled sheet would require 8 spots per inch, whereas, 12 to 14 spots are required for 22-gage, and 18 to 20 spots are required for 30-gage. Data as to the variables encountered in seam welding is given in Tables 5 and 6.

The use of synchronous interrupted timing is preferred for most seam welding applications since it controls the heat effect and allows each spot in the seam to cool under pressure during 'off' time; gives less distortion and warpage since it retards the tendency of the heat to build up ahead of the welding wheels; and also gives better control over surface disturbances caused either by a coating or inferior steel. Non-synchronous timing, or continuous timing, can be used on mild steel up to and including 20 gage with speeds of 30 inches per minute maximum. Slower speeds can be used at lower current values. Heavier gages can be welded; however, surface conditions become acute and wheel life is short.

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Table 5 Seam Welding of Mild Steel (9)

Gauge Thickness, Inches	Speed per Minute, Inches	Secondary Amperes	Wheel Pressures, Pounds	Weld Width	Wheel Face, In.	
					Upper	Lower
0.024	392	14000	600	0.093	0.250	0.250
0.029	392	14750	600	0.093	0.250	0.250
0.038	392	18000	600	0.109	0.250	0.250
0.044	300	19100	800	0.109	0.250	0.250
0.050	220	20500	1200	0.109	0.250	0.250
0.063	220	22000	1400	0.125	0.250	0.375

Table 6 Seam Welding of Mild Steel (9)

Gauge Thickness, Inches	Spots per Inch	Welding Speed In/Min.	Timing Schedule Cycles		Welding Current, Amperes	Wheel Pressure, Pounds	Welding Wheel Diameter	Wheel Face Width
			On	Off				
0.025	12.5	96	2	1	11,700	550	8 inches	0.156
0.031	12.5	48	3	3	10,800	600	8	0.156
0.031	12.5	96	2	1	12,200	600	8	0.156
0.031	12.5	144	1	1	15,700	600	8	0.156
0.039	12.5	48	3	3	12,300	600	8	0.187
0.039	12.5	48	4	2	11,500	600	8	0.187
0.039	12.5	96	2	1	15,000	600	8	0.187
0.039	12.5	144	1	1	20,200	600	8	0.187
0.049	12.5	36	4	4	13,000	750	8	0.218
0.049	12.5	36	2	2	17,600	750	8	0.218
0.049	12.5	72	3	1	15,000	750	8	0.218
0.049	11.1	108	2	1	19,000	750	8	0.218
0.062	12.5	36	4	4	15,400	750	8	0.250
0.062	12.5	72	2	2	20,700	750	8	0.250
0.062	11.1	108	2	1	21,400	750	8	0.250
0.078	12.5	24	6	6	15,100	900	8	0.250
0.078	9.4	48	4	4	18,600	900	8	0.250
0.078	12.5	72	3	1	21,300	900	8	0.250
0.109	12.5	24	6	6	17,400	1000	8	0.281
0.109	8.3	48	5	4	20,000	1000	8	0.281
0.109	12.5	72	4	2	22,700	1000	8	0.281
0.125	12.5	24	6	6	20,800	1200	8	0.312
0.125	8.3	48	4	5	26,300	1200	8	0.312

For high speed welding, it is recommended that welding be performed without an interrupter up to and including 20 gage. The heavier gages shown in Table 4 can be welded; however, surface appearance is poor and, for best results, synchronous timing should be used. Wheel diameters used (Table 5) were approximately 8 inches.

Note: The above tables indicate practical production methods for various thicknesses of steel. However, other combinations can be used, depending entirely on production procedures of articles to be welded.

MPM EXCLUSIVE FEATURE

a baked-on epoxy-resin enamel over an iron phosphate base applied by flow coating combine to make superior steel roof decking

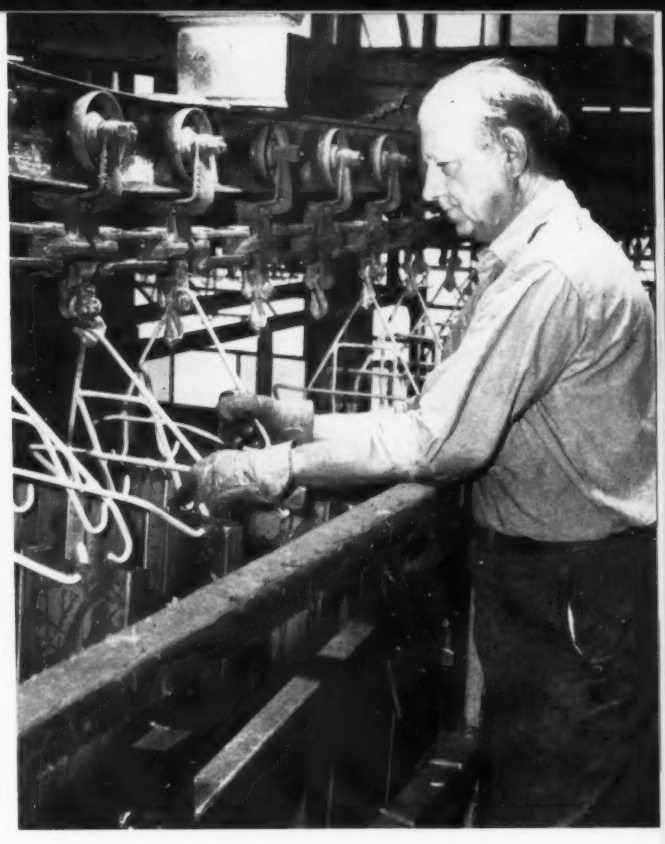
Operating the world's la

by John Sincere • TECHNICAL EDITOR

SINCE the start of production in May, 1956 the success of Milcor Steel Roof Deck made by Inland Steel Products Company, Milwaukee, Wisconsin, has been outstanding. The roof decking is finished in the largest automatic flow coating paint installation ever built. It was part of a five million dollar expansion program for Inland.

The superior finish on Milcor Steel Roof Deck is a baked-on epoxy-resin enamel over an iron phosphate base. The new finish is similar to that commonly used on refrigerators, washers, dryers, and other appliances. Even though the materials used in the production of this superior finish are more expensive than any used previously, the cost of the roof decking is no greater - - a tribute to the engineering skill of the designers of this enormous flow coating line.

The baked-on epoxy-resin enamel primer resists the scuffs and scrapes which commonly mar ordinary roof deck



Above: This is a view of the loading platform 30 feet above the floor, where the panels are hooked to the conveyor. The hoist (lower left) simplifies an otherwise difficult task. Right: A closeup of the loading station. Note the six-pronged hooks which enable handling of any one of the three types of panels processed.

d's largest flow coating machine

finishes in shipping and handling and during the activity of construction. If the finish is damaged, the iron phosphate coating prevents corrosion from spreading over the metal surface or undermining the paint.

Sales doubled

Proof of the success of this prime finish on roof decking is that 1957 sales are expected to be more than double sales for the last comparable year, 1955. This sales total will exceed even the most optimistic estimate made before the new finishing line was completed. The key to this outstanding sales success was, of course, the planning by the engineers in charge of the new finishing line project, along with the contributions of several manufacturers of the materials and equipment. Interesting is the fact that the idea for the flow coating line originated with a supplier and one of the engineers who was most closely connected with the final development of the finishing line

From its very inception the idea for installing the largest flow coat paint finish line was enthusiastically pushed ahead by Inland Steel Products executives because they knew that the sales potential for a real quality roof decking at a competitive price would be a boon to the company. There were many outside the company who felt the new finish would be too expensive to compete with other finished roof decking because of the more expensive materials being used. However, the planning of the new finishing line was so well done that the overall production cost of fabricating and cleaning (including coating with iron phosphate), flow coating the paint and baking was comparable to the cost using the old method of fabricating and dipping.

New customers

One of the most gratifying results of the sales increase was the addition of several new customers that had never considered the idea of specifying painted roof decking before. These new customers had previously felt that painted roof decking was too inferior to be used in their construction projects.

Now, these newly-won customers are convinced that Inland's roof decking is saving them money. Not only have new customers been added but, according to the sales staff of Inland, a number of architects have begun specifying the use of Milcor Steel Roof Decking instead of galvanized roof deck.

Equipment custom built

The entire paint finishing line, including the cleaning section, was custom built to handle roof deck panels that are up to twenty-eight and a half feet in length. The actual height of the entire finishing tunnel is approximately thirty-five feet. One of the original objectives in making the tunnel this high was to provide a means for finishing roof deck in lengths longer than those handled in the old dip tanks. The inside width of the tunnel is exactly thirty-two inches, to accommodate the widest panel and to allow room for the rotating spray arms

The rotating spray arms form the operating "core" of the paint finishing line. Six different liquids are dispersed -- each at the same rate -- through the spray arms. The spray arms do not overlap each other vertically so each of the nozzles had to be set at an oblique angle to insure proper coverage at all points of each panel.

Another factor in the proper set-up of the spray arms was that the panels move through the tunnel at a right angle to the path of the rotating arms. This

At this point, the panels are emerging from the oven chamber where they were subjected to a temperature of 370° F. to polymerize the epoxy-resin paint. This insures against scuffs and scratches that could mar the surface.

means that the deep grooves in the panels have little chance to be reached directly by the impinging spray. The problem resolved itself, however, after the spray arms were put into operation, because the atmosphere in the tunnel became a maelstrom of liquid and reached the seemingly inaccessible portions of the deeply grooved panels quite adequately.

Four spray arms are arranged in a line from top to bottom for each cycle of cleaning and painting with the exception of one cycle -- application of chromic acid which has five arms. Five arms are necessary in this cycle to insure the even distribution of solution on the surface of the panels.

Originally, the rotating sprays were set to revolve at a speed of sixty rpm, but after the line was in operation for a while the engineers at Inland found that this was an excessive rate. Centrifugal force was causing the intermixture of chemicals from cycle to cycle causing the loss of chemicals. The arms were then found to operate best at 26 rpm's.

Ten-step process

The roof deck undergoes a ten-step painting process, each step being controlled electrically for uniform quality. The process is described as follows:

1. A chemical acid cleaner to remove all dirt, grease, and lubricating oils. Six lbs. of cleaner for every 100 gallons in a 1700-gallon tank maintained at a temperature of 155-165°F.

2. A hot water rinse to remove the chemical cleaner residue. Temperature of the rinse water is maintained at 160°F.±5°F. A 1700-gallon tankfull is discarded twice a week for a two-day shift, in addition to a continuous overflow.

3. Iron phosphate solution to cover the steel panels with a conversion coating buildup of 70 to 100 mg per square foot. The strength of the solution is maintained at 45 lbs. of iron phosphate for each 100 gallons in a tank of 1400 gallons capacity. Twelve oz. of caustic soda is also added for every 100 gallons. All of the spray nozzles in this section only must be checked weekly to insure top efficiency.

4. Water rinse from an unheated 688-gallon tank. Constant overflow during operation. On a multiple shift operation the tank is dumped twice each week.

5. Chromic acid rinse to inhibit the action of the hydroscopic salts. This solution was originally heated in order to promote drying of the panels after passing this cycle. (It was found that heating was not necessary after the process had been in operation for some time.) Capacity of the tank is 1173 gallons, and the build-up solution strength is 1½ lbs. for each 100 gallons.

6. Deck is dried for 7 minutes in the oven at 300°F. and allowed to cool for 8 minutes at room temperature.

7. Epoxy-resin enamel primer is flow-coated on to form a heavy, continuous coating. The thickness of the coating ranges from 4/10 mil at the top of the panel to 8/10 at the bottom. Future plans call for the rearrangement of the painting operation to "hold back" the flow of the paint at the top of the panels and achieve a more uniform coating from top to bottom.

8. The wet painted panels are held in the paint solvent vapor atmosphere of the vapor-drain chamber, where it is permitted to drain to a uniform thickness, free from runs and sags. The time spent in the drain chamber is 13½ minutes which is a change from the original 20 minutes when the process was planned.

9. The epoxy-resin enamel is polymerized and hardened by baking in the oven portion of the tunnel at a temperature of 370°F. Originally, the tem-

MPM PHOTOS

Below: Unloading hoist with a 20-unit load about to lower panels to floor for shipping. Note hydraulic cylinders for raising and lowering hoist.

perature of baking was maintained at 400°F., but it was found after some months of operation that this level was not necessary.

10. The deck is allowed to cool to room temperature to harden the surface before handling.

At the start of the process in May, 1956 the conveyor was run at a speed of six feet per minute but, because production demands became greater than originally anticipated, the conveyor speed was increased to nine feet per minute. After the process was in operation for some time it was found that, with the increased conveyor speed, more space should have been provided for when the line was built, to allow for additional cooling time.

Handling minimized

Handling is accomplished throughout the process in a most efficient manner. The panels are hung onto the conveyor chain by just two men assisted by an ingenious hoist that lifts the panels to an 85° angle. Since the panels are loaded onto pallets in units corresponding to the order from the customer, initial hanging of the panels is done in the same number of units so that when the panels are unloaded they fit onto a pallet according to the order.

One of the most unique parts of the entire finishing line at Inland is the handling of the panels from the roll forming line to the machine and subsequently from the flow coating machine to the shipping line. The roll forming machine is located adjacent to the paint finishing line, thereby enabling a minimum amount of handling from point to point. As the panels leave the roll forming machine they are arranged by hand in a nested set according to the customer's order. Every other panel is turned over so that the grooves of one panel are against the next panel. This eliminates a handling operation at the finish end which cuts down the possible damage that could be done to the newly-finished panels.

The hoists that are used to transfer the panels from the forming line to the paint finishing machine, and from the finishing machine to the shipping area, were specially designed by Inland. This handling system is so unique that Inland is obtaining patents on the basic idea. Never before had any device of this size been made. Its successful operation was one of the keys to the operation of the flow coating machine. Twenty or more panels are loaded onto the lifting hoist and clamped. At an all clear signal, the hoist moves upward on a mechanically-actuated pivot. It automatically rises to the loading station to the predetermined angle of 85°.

The reverse of the loading process is followed at the unloading station where a similar hydraulically-operated hoist is used to lower the panels so that they can be palletized and strapped for shipping.

Solution control

All the cleaning solutions are controlled by titration methods outlined by the chemical supplier on a schedule of at least once an hour. In addition to this manual control of the process, an automatic proportioning feed device is used to mix the iron phosphate solution and add it to the tank.

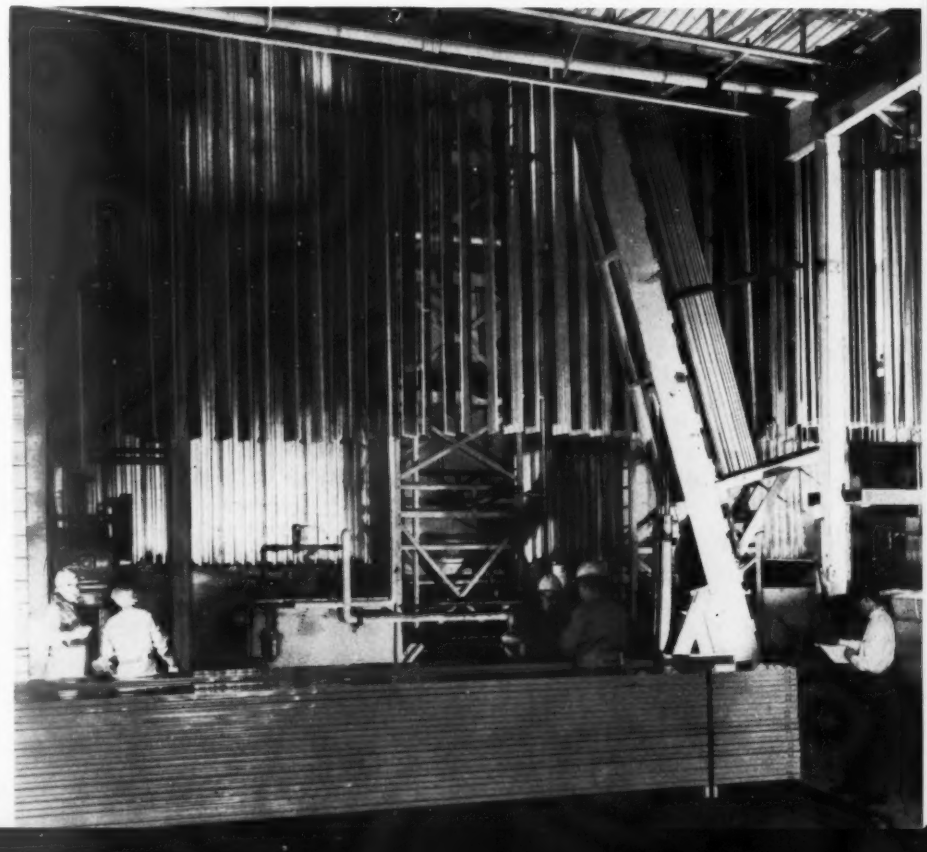
Each of the heated tanks is maintained at the required temperature by steam coils, controlled electrically. The entire line is designed so that a minimum amount of manual effort is necessary to keep the process functioning properly.

Cost of process

As stated previously, the cost of the entire painting process, excluding the steam and gas cost, is practically the same as that for the old dip method of paint application. The total cost of fabricating and painting the Roof Deck, using the iron phosphate base and an expensive epoxy-resin finish, is slightly less than the old dip method, *without* using an iron prosphate base, and *without* using an expensive epoxy-resin finish.

Further proof that Inland Steel Products has taken the right step in finishing is the fact that another manufacturer of steel roof decking is installing a flow coating paint line with an iron phosphate coating and an epoxy-resin primer finish.

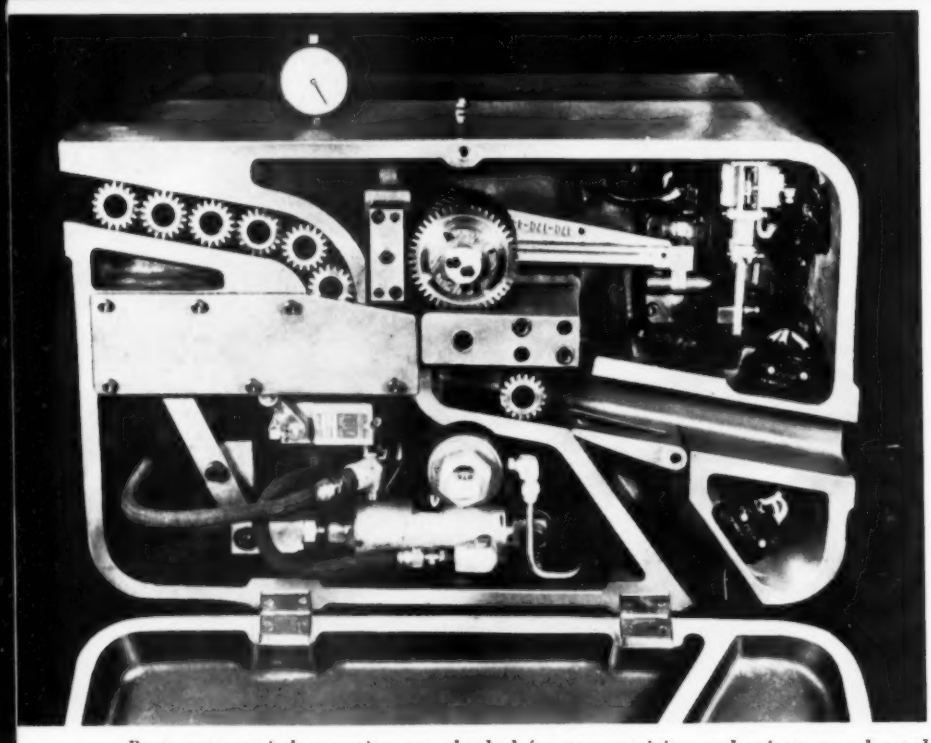
Hourly checks of solutions are made to insure that absolute uniformity is maintained. Operator titrates sample of one of the cleaning solutions.



MPM PHOTOS

In background, the unloading hoist is lowering a unit of panels that will be strapped and shipped immediately. In foreground, a shipment is being readied.

Interesting Industry Developments



Parts enter unit by gravity, are checked for concentricity, and rejects are shunted from checker via chute. Gage supplies visible indication of eccentricity.

Automatic gear monitoring unit checks concentricity

AN automatic gear monitoring unit that inspects spur or helical gears for concentricity is the latest addition to a gear classifier line. The unit uses conjugate rolling action in two directions of rotation, with a master gear in mesh with a part to determine and monitor the amount of eccentricity in the part. After checking, parts within predetermined tolerances are automatically passed to the next operation; parts that are eccentric are shunted from the system.

The unit is designed for integration into automated production lines, and the central panel can electrically operate allied automation units.

For further information, contact Dept. MPM, Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Solderless connector speeds electronic wiring

A SOLDERLESS multi-lead plug-and-receptable connector, designed to speed the wiring of electronic harnesses, and to achieve greater dependability and versatility, has been introduced. Called the "Hyfen," the connector has two mating units, a plug and a receptacle. Instead of being soldered, pins and sockets are crimped to wire ends by manual or high-speed tools.

The method is said to be not only faster than soldering, but also to make more reliable, more easily-checked connections. Elimination of solder fluxes and dissimilar metals improves resistance to corrosion. A minimum number of contact points also reduces reliability problems.

For further information contact Dept. MPM, Burndy Corp., Norwalk, Conn., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Multi-lead plug-and-receptacle connector developed to eliminate soldering, and to speed wiring of electronic harnesses. Pins and sockets are crimped on wire.

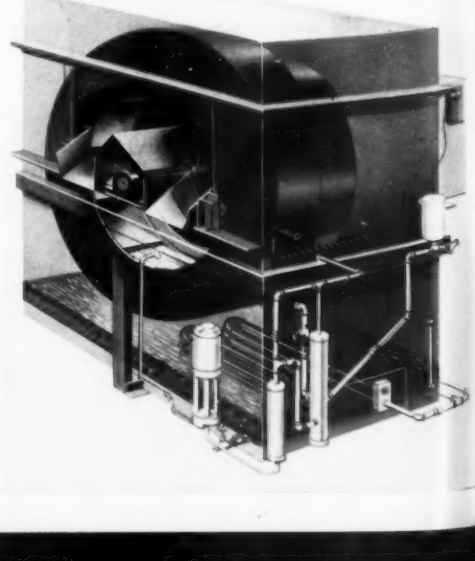
Automated degreaser

EFFICIENCY and economy in metal cleaning by combining solvent degreasing with automated work handling is claimed for the Model 1DD750 rotary drum degreaser. It provides cleaning of such products as nuts, bolts, fasteners, stampings, and screw machine parts. In-process cleaning, cleaning before heat treatment, cleaning before plating, phosphatizing, bright dipping, and final cleaning are handled with savings on initial investment, operating costs, and space requirements, it is claimed.

Parts to be cleaned enter via a conventional chute. They are carried through the degreaser by a screw-type drum which tumbles the parts, subjecting them to vapor and immersion cleaning, and final vapor rinse and drying. Parts are then discharged through a chute on the opposite side.

For further information, contact Dept. MPM, Detrex Chemical Ind., Inc., Box 501, 14331 Woodrow Wilson Ave., Detroit 32, Mich., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Degreasing unit cleans nuts, bolts, fasteners, stampings, and screw machine parts. Steam heated, it handles five cubic feet per hour with a rated capacity of 2,000 lbs. of steel or brass per hour.



Electromagnetic drill press operating in vertical position, demonstrating versatility of magnetic feature. Power feed can be engaged or disengaged during operation.

Automatic power feed electromagnetic drill

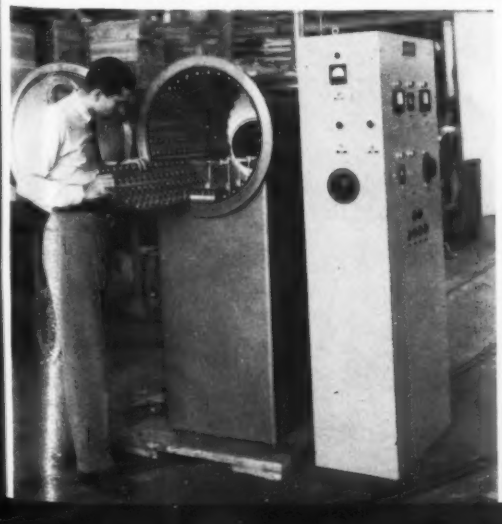
AUTOMATIC power feed has been added to the Portomag electromagnetic drill press. While the electromagnetic base holds the drill press in position, the power feed makes it possible for the operator to run the drill point down to the center punch mark, and turn on the automatic feed.

Power feed can be engaged or disengaged at any time during the drilling operation, and the depth of cut per revolution can be set according to the size drill bit being used, it is claimed. The Portomag can be taken to the job, is said to lessen operator fatigue, and will drill up to 1¼ inch, and tap 1-inch holes, according to the manufacturer. For further information, contact Dept. MPM, Portomatic, Inc., 1511 East Nine Mile Rd., Ferndale 20, Mich., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Finishing reflectors by vacuum metallizing

LOW cost mirror finishing of reflectors for flashlights is being done by a labor-saving vacuum metallizing process which eliminates the need for buffing and polishing. The unit, called Model 425, can metallize 480 reflectors every six minutes, it is claimed.

Strips of pure aluminum are vaporized, take flight, and condense on reflectors.



The stamped sheet metal reflectors are first loaded into special curved holders, each holding 80 reflectors, which carry them through all of the stages of the finishing process. Next, they are sprayed with a base coat of a synthetic lacquer, which fills in any minor imperfections in the surface of the stamping. This coating is then baked to give it a hard, glossy-smooth surface which will receive the metal reflective coating. The six curved holders are then slipped into place in the vacuum chamber, and a thin layer of molecular aluminum is deposited on the reflectors by evaporation.

For further information, contact Dept. MPM, F. J. Stokes Corp., 5500 Tabor Rd., Philadelphia 20, Pa., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Unit enables operator to see, on an enlarged image, any variance in dimensions.

Micro projector of improved design

INCORPORATING a new concept in design, the Micro Projector features a vertical principle offering four advantages: a) A horizontal stage onto which work of a flat nature is laid without aid of fixtures or holding devices. b) A comfortably-inclined screen on which the enlarged image is reproduced directly in front of the observer. c) A choice of fixed standard magnifications that are changed by slipping different projection lenses into a vertical socket in which they rest by gravity. d) When using the micrometer cross slide, both measuring motions are performed on the same plane, namely the horizontal and most natural one.

A rigid floor base makes the unit a self contained one. The column slide is adjustable for wear by means of gibs, and will hold square indefinitely, it is claimed by the manufacturer. A graduated adjustment will tilt the stage to a desired helix angle of a thread, or rake angle of a form tool, etc. The 4-inch diameter stage opening, and a 14-inch diameter round screen, result in extra-large capacity.

For further information, contact MPM, George Scherr Co., 200 LaFayette St., New York 12, N. Y., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

a representative of government, a professional designer, a home economist, and an architect present their views on the program of the . . . .

26th annual meeting of the Porcelain Enamel Institute

PROGRAM committee chairman, A. S. Ault, and the weatherman were given joint credit for furnishing one of the most enjoyable and constructive meeting programs in the history of the Porcelain Enamel Institute. The PEI membership met at The Greenbrier, White Sulphur Springs, October 3-5 for the Institute's 26th annual meeting.

Officers for 1958

The PEI elected its officers and board of trustees for 1958 at the principal business session.

James W. Vicary, President, Ervite Corporation, Erie, Pennsylvania was re-elected President of the Institute to finish serving a two year term of office. Vice Presidents are: A. S. Ault, Chicago Vitreous Corporation, Cicero, Illinois; J. F. Corkill, U. S. Borax & Chemical Corporation, New York, New York; W. H. Lowry, Vitreous Steel Products Co., Cleveland, Ohio; H. F. MacIntyre, Ferro Enameling Co., Oakland, California; H. McE. Patton, Ingram-Richardson Mfg. Co., Beaver Falls, Pennsylvania; H. A. Ringelberg, Challenge Stamping & Porcelain Co., Grand Haven, Michigan; R. N. Smith, Temco, Inc., Nashville, Tennessee; H. R. Spencer, Jr., The Erie Enameling Co., Erie, Pennsylvania; and J. C. Winget, Armco Steel Corporation, Middletown, Ohio.

P. B. McBride, Porcelain Metals Corporation of Louisville, Kentucky, was re-elected Treasurer. Glenn A. Hutt, Ferro Corp., Cleveland, Ohio, Past President of the Institute, was elected to the position, Chairman of the Board of Trustees. John C. Oliver of Washington, D. C. was re-elected Managing Director and Secretary of the Institute.

Three industry men honored

As a highlight of the annual institute banquet, three men who were the early proponents of a cooperative organization in the porcelain enameling industry and who later became very active in the Institute after it was formed, were invited to attend the Institute banquet to receive special honors.

The three men were Bennet Chapple, Sr., former assistant to the president of Armco Steel Corporation and now a special consultant to the firm; Robert A. Weaver, chairman of the board of Ferro Corporation and first president of PEI, and William Hogenson, president of Chicago Vitreous Corporation, treasurer of the Institute from 1930 to 1947. Both Hogenson and Weaver were named as founders of the organization.

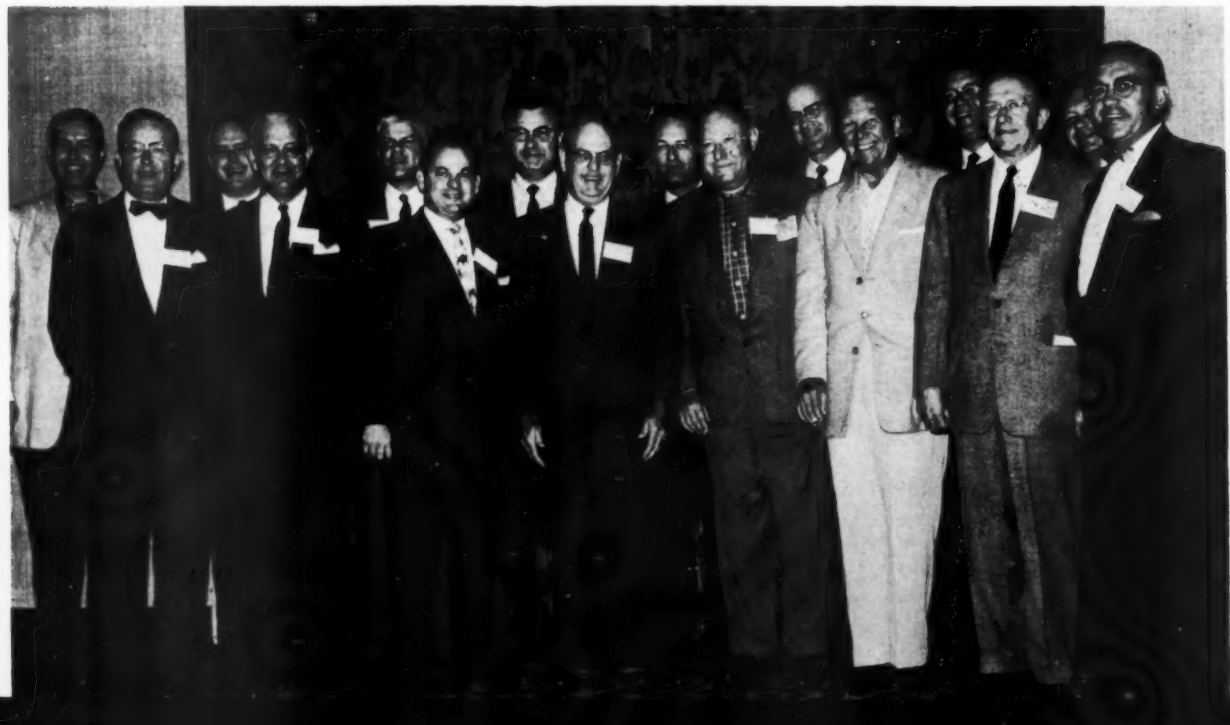
The three men were honored before the banquet session "for their services and contributions to the PEI".

Insurance policy of defense

Keynote speaker at the three day meeting at the Greenbrier was J. Lewis Powell, who is on the staff of the Assistant Secretary of Defense (Supply & Logistics). He told the group that this avalanche of obsolescence in recent years creates a demanding need for an informed military industry team geared to keep pace with technological change in the advent of war.

"Since we can no longer stock-pile for war, the ability of industry to produce weapons quickly and efficiently is the means to prevent war," he said. "With this in mind", Powell pointed out, "industrial planning is the insurance policy of national defense that

Members of the newly-elected board of trustees of the Porcelain Enamel Institute pose for the MPM *camera.*



matches specific potential military customers to individual potential producers."

Designer, home economist and architect voice views

In a general meeting on October 4, the porcelain enamel executives heard three speakers from widely diverse fields describe how the various advantages of porcelain enamel serve industrial designers, home economists and architects.

Joseph R. Mango, a pace-setting young industrial designer from Chicago, who has revamped the appearance of everything from vacuum jugs with legs to ultra-modern appliances and complete kitchens, spoke to the group on the subject of "An Industrial Designer Views Porcelain Enamel". Mango emphasized the importance of color and the physical and chemical characteristics of porcelain enamel in designing for mass consumer appeal.

With slides used to illustrate his discussion, Mango showed sketches of the kitchen of tomorrow, a mobile laundry and, in colored pictures, presented kitchens by Koppes, Mutschler, Youngstown, Geneva, Caloric, and Universal.

His bathroom of the future or "health room". as described in an earlier issue of MPM*, includes wall murals, laundry equipment, electronic scale, built-in clock, steam facilities, three-dimensional T-V, therapeutic lamps, and exercising equipment.

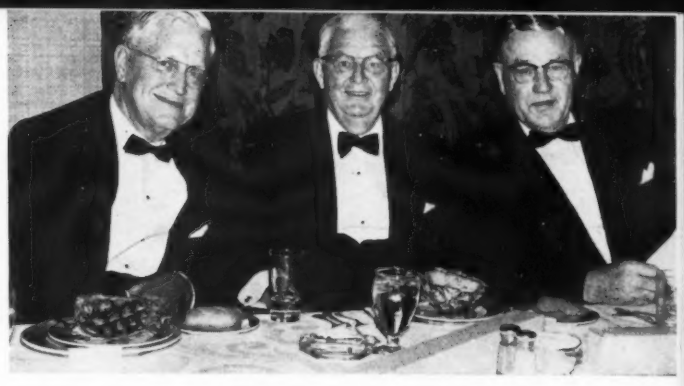
Other illustrations which drew the attention of his listeners included photographs of an Emerson desk fan, Thor Industries (Canada) washer-dryer pair, Cribben and Sexton range, and Vaculator automatic coffee brewer, a "charcoal caddy" or grill and freshly styled picnic equipment.

Mango told the enamelers that the designers should be properly indoctrinated and have suitable samples for use. He said. "There's been too much technical level contact and too little top management contact."

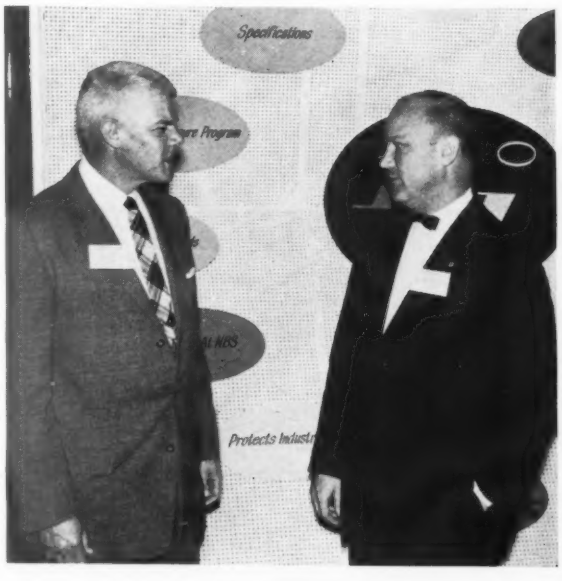
Porcelain on aluminum, a complete new market

Mrs. Jessie Cartwright, home service director of Norge Division, Borg-Warner Corporation, and a nationally known lecturer, home making adviser, and training instructor, spoke on "Porcelain Enamel — As Viewed by a Home Economist". She reviewed the three stages of woman's progress from the wood burning range through woman's suffrage to the present where she says women are

to Page 76 →



L. to r: Bennett Chapple, Sr., Armco Steel Corp.; R. A. Weaver, Ferro Corp.; and Wm. Hogenson, Chicago Vitreous Corp. were honored for their services and contributions to the PEI.



James W. Vicary, Ervite Corp., president, PEI*; and Wm. B. Tabler, Hilton Hotels Corp., architect, who spoke on "An Architect's View of Architectural Porcelain Enamel."*

EXCLUSIVE MPM PHOTOS.

L. to r: John C. Oliver, managing director, PEI*; J. Lewis Powell, office of Assistant Secretary of Defense, (Supply & Logistics); and Glenn A. Hutt, Ferro Corp., and chairman of the board,* PEI.

L. to r: A. S. Ault, Chicago Vitreous Corp., program chairman; Mrs. Jessie Cartwright, home economist, Norge div., Borg-Warner Corp.; and Joseph R. Mango, industrial designer, Banko-Mango Design.

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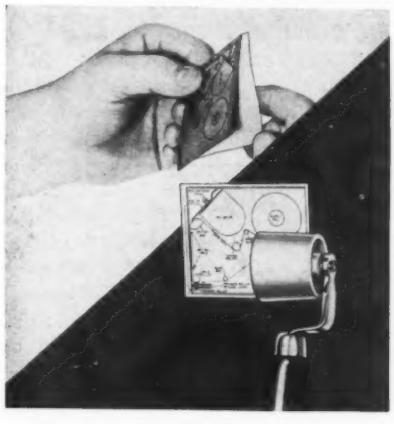
NEW Supplies and Equipment

METAL NAMEPLATE APPLIES IN TEN SECONDS



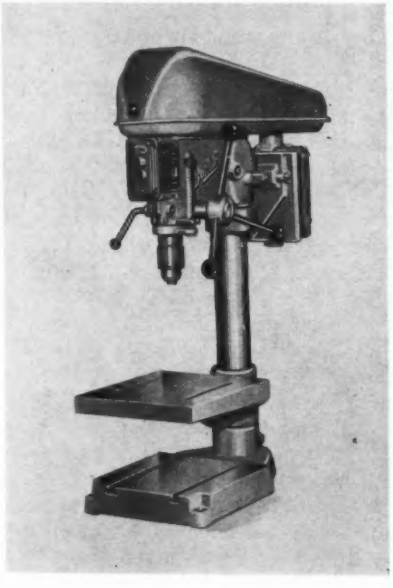
A new type deep-anodized, self-bonding metal nameplate, called "Quik-Plate," has a permanent pressure-sensitive adhesive that requires no activation by water, solvent, or heat, according to the manufacturer. To apply, one need only remove the Blue Streak Release Liner. Made from .004" aluminum, they adhere instantly to metal, glass, plastic, wood, paint, and smooth, wrinkled, or curved surfaces. For further information, contact Dept MPM, W. H. Brady Co., 727 W. Glendale Ave., Milwaukee 9, Wis.

LOW-TEMPERATURE STANDARDIZED FURNACES

A line of small "packaged" furnace units particularly adapted to the low-temperature (1000° F.) enamels used on aluminum, aluminized steel, and stainless steel has been announced. The furnaces are the slot-in-roof box type with manually-operated trolley suspension components. They come with or without forced convection in both gas-fired radiant tube or electrical models. The furnace features uniform temperature control, and minimized heat loss is obtained by lining the steel shells with insulating brick and block. The units are two feet wide, four feet high, and come in either six or twelve-foot lengths. Both sizes are "modular" in that the units may be joined end-to-end to make a furnace of nearly any desired length. For further information, contact Dept. MPM, Ferro Corp., 4150 E. 56th St., Cleveland 5, Ohio.

BENCH, FLOOR, AND PEDESTAL MODEL DRILLING MACHINES

A line of drilling machines, tappers, and accessories has been introduced, incorporating many refinements in design which facilitates operation, maintenance, and flexibility, according to the manufacturer. The No. 15 drilling head achieves maximum ease of operation, with a minimum of operator fatigue, it is claimed. Improvements include front-mounted "start-stop" push button switch, easily-seen speed range table, depth gauge graduated for easy setting, and three-grip spindle feed. Belt guard tilts upward to simplify speed changes. For further information, contact Dept. MPM, Buffalo Forge Co., Buffalo, N. Y.



CONTROL FOR APPLIANCES

A compact, low cost control, permitting an unlimited number of heat settings, is available for 118 or 236-volt use. Utilizing a heated bimetal for fast, clean contact action, these controls will pinpoint and maintain a selected input at any point between six and 100 per cent of element capacity, eliminating knob-twitching between too hot and too cold. The controls are said to have been used successfully to control electric range elements, etc. For further information, contact Dept. MPM, Proctor Products, Third St. and Hunting Park Ave., Philadelphia 40, Pa.

GOLD FINISH FOR PORCELAIN ENAMEL

Development of a method of applying 22-carat gold permanently to the surface of porcelain enamel has been announced. The process is expected to have its broadest use in architectural panels, column covers, and other trim members, and in signs. Known as "Porcelgold," the product is available as a speckled porcelain enamel finish. The finish is applied over other solid porcelain enamel colors. The gold is permanently fused to the surface, and the material provides weather resistance equivalent to other types of porcelain enamel, according to the manufacturers.

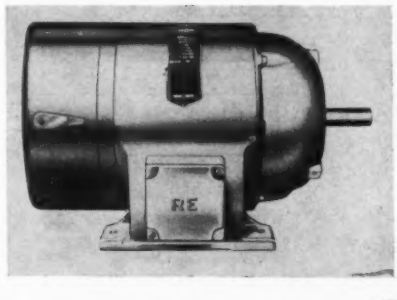
For further information, contact Dept. MPM, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.

NEW ACID INHIBITOR

A new inhibitor for use in acid solutions has been announced. Called "Acid Inhibitor 11," it can be used on high carbon steel without etching. For further information, contact Dept. MPM, Enthone, Inc., New Haven, Conn.

BRAKEMOTOR PACKAGE

Single-frame Brakemotor "packages" are available, designed for each other, giving compact, clean lines, according to the maufacturer. The wafer type brake reduces overall dimensions to a minimum, it is claimed, and provides engineers with increased versatility when adapting to their equipment. The brake's "doughnut" type magnet permits extending the shaft clear through it. It may be mounted on the input or output side of gears or fluid couplings. For further information, contact Dept. MPM, Reuland Electric Co., Alhambra, Calif.



EDITORIAL NOTE: Second in a series of articles on the service problem in Home Laundry Appliances. (See "The Service Problem in Home Laundry Appliances," by Margaret Davidson, on page HL-22 in the September, 1957 issue of MPM.)

AHLMA's fifth annual parts and service conference

THE fifth annual American Home Laundry Manufacturer's Association Parts and Service Conference held recently at the Edgewater Beach Hotel in Chicago was a meeting of trade school educators, home laundry manufacturers and magazine editors, all seeking the answer to the most vexing problem in the appliance industry — product service at the consumer level.

The first half of the conference covered the question of what is being done to train additional, greatly-needed service men. Under the general heading, "Better Service Through Basic Vocational Training", Ted Leisenring, coordinator, Trade and Industrial Department, Denver (Colo.) Public Schools, spoke on the outstanding work that has been done there to train increasing numbers of competent service personnel.

Leisenring said that with the cooperation of the appliance manufacturers the course of training has become a useful tool for improving the overall service problem on appliances in the area.

Don Stover of the Electronic Industries Association told of the steps taken by his organization to improve the service problem existing in the radio and television industry. The biggest specific problem, he said, is keeping the courses taught in trade schools up to date with the electronic changes that are always taking place. To do this, EIA holds teacher training seminars at regular intervals (usually every six months). According to Stover, this program has helped a great deal in keeping radio and television personnel informed of latest electronic improvements.

Stover said that the association contact with the trade schools has brought about a more practical approach to the teaching of electronic service men. He said that EIA has helped simplify course material so that only a minimum of theoretical teaching is needed. Practical examples are used in the majority of cases for the dual purpose of speeding up learning and to acquaint the students with the work that they will be doing.

Survey AHLMA's progress

The question of how much AHLMA should do to set up courses of instruction for improving service was discussed by S. Robert Payne, general service manager for The Maytag Company. He reviewed the progress that has been made by AHLMA up to date by reporting that initial attempts to interest public schools in selected communities were not immediately successful, because the schools had not received sufficient demand for such courses. He went on to suggest that servicemen, if they want such courses, should request them from school officials. An alternative in some cities might be good private vocational schools, he said.

Another factor in setting up an industry-wide program to train service men, Payne further stated, is that individual problems of companies vary enough to make the task of setting up an industry-wide program difficult. From his experience in working with the parts and service committee of AHLMA, he said the following three questions need answering before more fruitful work can be done in improving service: 1. Are manufacturers obligated to dealers to supply education in servicing? 2. If there is a great need for improved service, why don't trade schools offer courses in this field? 3. Would it be best for AHLMA or the individual companies to set up training programs?

The second half of the conference was devoted to comments by editorial specialists at the dealer and consumer levels, and by reports on what has been done by the manufacturers.

Homemakers' reactions

Miss Margaret Davidson, homemaking editor of LADIES' HOME JOURNAL, reported that laundry appliances are mentioned more times than any other appliance in complaints or comments from consumers to the publication. She said, too, that service problems represent by far the largest single category in reader correspondence.

Miss Davidson said that women want to know, among other things, where to find competent servicemen if something should go wrong. Adjustments, replacements, and repairs should be available in *every* locality where the appliances are sold, she said.

The following are a few brief "gems" from Miss Davidson's discussion.

"Defective devices and ineffective service represent sales tools in reverse".

"The serviceman may be more important than the president of an appliance manufacturing company *at the time of his visit*".

"The little niceties of service are important". (The serviceman should be trained to be neat, efficient, and courteous.)

"Women resent being made 'guinea pigs' for appliances not fairly proven".

Miss Davidson suggested that there would be less resentment to the cost of service if advance information in regard to prices were supplied. She suggested a "procedure check list" for service personnel, and that by all means service policies should be transposed from legal to lay language.

This speaker believes that in many instances buyers consider price to be indicative of quality, and therefore women often buy models with the greatest number of features and, therefore, the greatest service problems in the belief that they are buying the reliable, long lasting models.

It would be logical, Miss Davidson feels, for the home appliance manufacturer to turn to the women in his own home service department for suggestions relating to this service problem.

Laurence Wray, editor of ELECTRICAL MERCHANDISING, referred to appliance service as "a public relations problem of staggering proportions which may grow worse before it becomes better."

In referring to over 50,000,000 home laundry appliances and over 130,000,-

IN HOME LAUNDRY APPLIANCES

000 other appliances in use, Wray said it was amazing to him that the industry doesn't have a blacker mark against it as a result of the tendency to "buck passing" as to who is responsible for poor service conditions.

Editor Wray feels that the last five years have represented the most drastic shake-up in appliance industry history. The "distributing revolution" in appliances complicates the service problem. Some of the principal factors in this revolution are: 1. Abandonment of one price system; 2. expansion in plant capacity; 3. mass pre-selling at the home level; 4. decline in specialty selling skills; 5. rise of the discount houses; 6. mergers; and 7. relatively high saturation points for most appliances.

Sales of large quantities of appliances through contract builders serve to accentuate the service problem in that there is usually no provision for service from this source.

On the constructive side, Wray included the following points in his suggestions for improving consumer service: 1. Recruiting programs for service men; 2. institutional national advertising by manufacturers and associations; 3. improved training facilities; 4. scholarships; 5. new product information available when product is first sold; 6. public relations courses for service men; 7. incentive program; 8. salaries, promotions, and possibly profit sharing by the servicemen; 9. justification of cost to customer; and 10. paid time off for service "schooling". He suggested the possibility of a cooperative program on service similar to the "Live Better Electrically" program.

The manufacturer's approach

John H. Miller, manager of appliance service, General Electric, and C. E. Ruelle, product service manager, Hamilton Manufacturing Co., told how their companies have attacked the problem.

Miller explained that in G. E.'s case, before a new appliance is introduced, all of the service representatives and dealers are given a thorough introduction to the product to assure complete familiarity with its mechanism before it reaches the consumer. Of all the major appliances, home laundry equipment is among the most complicated, and the newer models with greater service features require more skill and care in installation and more skill in service.

Miller said that the consumer feels that product service has not kept up with design and production, and in some instances, that the manufacturers are only interested in "selling".

Buyers have become more critical, he said, and with this change product service has become more important to the continuing profitable growth of each appliance manufacturer.

With the fantastic growth in the number of units sold, and the amazing increase in the degree of automaticity, there must be correspondingly greater skill in installation, more careful instruction of the customer in the proper operation and care of the products, and service which is more frequent and more skillful.

"From an industry standpoint," said Miller, "I strongly suspect that the greatest single need is for a change of attitude . . . . to regard service as an opportunity, instead of a responsibility".

This relates to pertinent questions raised earlier in the speaker's discussion: "What are we really trying to accomplish? Are we trying to minimize our complaint costs and parts inventories, or are we trying to ensure for our customers the full labor saving convenience which was designed and manufactured into our automatic washers and dryers? Are we trying to keep down the number of customer complaints, or are we trying to help sell our home laundry products?"

Ruelle said that Hamilton starts at the drawing board to incorporate design features that will reduce service problems in the field to a minimum. Complete approval of the design must be given by the service department before production can be started. Hamilton considers service manuals a very important item in the company's program to instruct service personnel.

Any company product (appliance) is a compromise between service, engineering, manufacturing and sales, he said.

Ruelle said that his company distributes service literature free, and described the cost as "a drop in the bucket" compared to advertising expenditures. In backing up this policy, he said, "We at Hamilton feel the area of service publications and field communication is of paramount importance." In continuing, he said, "The communications problem probably will never be solved completely, but if each of us, as manufacturers, continues to improve our own communications pattern, and offer assistance and technical information to dealers and individuals, upon request, we should be able to keep the field adequately informed."

In closing, Ruelle said, "A need for easier serviceability in the future is a definite necessity. Built-ins are becoming increasingly popular, combination machines are generally heavy and bulky, and the laundry area is shifting from the basement to the kitchen or utility room. All of these factors demand easy accessibility to functional parts of the equipment. The manufacturer who fails to take this into consideration will soon lose the good graces of the American serviceman. Let us not forget the serviceman talking to Mrs. America can be our best or worst advertisement."

Left to right: Guenther Baumgart, AHLMA; *C. E. Ruelle, Hamilton; W. G. McNeal, Hotpoint; Margaret Davidson, Ladies Home Journal; Laurance Wray, Electrical Merchandising; and J. H. Miller, General Electric.*

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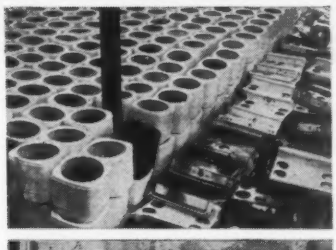

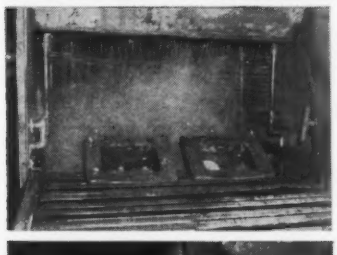

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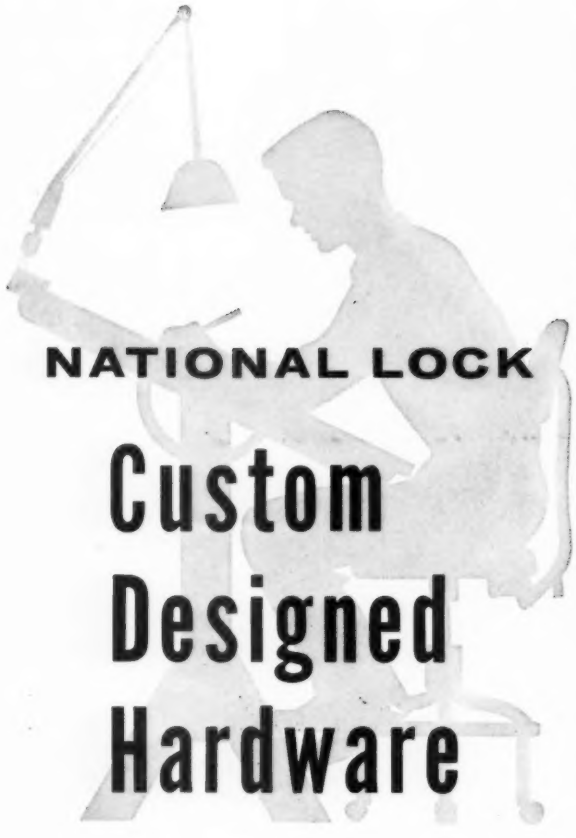

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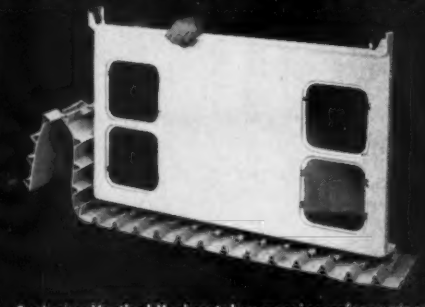

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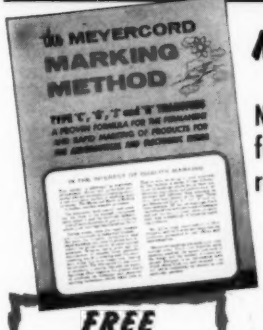

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A material is available that is said to provide an excellant base for sparkling, durable paint finishes on automotive equipment, home appliances and industrial products by chemically converting steel surfaces to a non-metallic phosphate coating. It not only greatly increases the adhesion of the finish, but also provides good corrosion resistance even when used in conjunction with a relatively thin and flexible paint film. These coatings are easily and economically applied to steel surfaces by dipping, spraying or brushing. Write Dept. MPM for bulletin 1380, American Chemical Paint Co., Ambler 33, Pa.

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Large heavy gauge automotive parts, formerly produced at rates up to 20 strokes per minute on relatively modern machinery are now said to be produced at 90 strokes per minute on a press line by Wean. All components from ready stand to stacking table, are engineered to work together as a single unit. Thus, the complete line is capable of producing at maximum press speeds. From 20 to 300 tons can be handled on these press lines. Write Dept. MPM for your copy of Wean "Flying Press" brochure, Wean Equipment Corp., Cleveland 17, Ohio.

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A ¾ inch nickel-chromium alloy rod is said to have been in service at 1700° F. for better than two years at Kent Corp., Los Angeles. A thin oxide coating had formed but did not flake off because it was very strong and adherent. A booklet is available entitled "Keeping Costs Down as Temperatures Go Up" from Dept. MPM, The International Nickel Co., Inc., 67 Wall St., New York 5, N.Y.

ALUMINUM FINISHING INFORMATION

Free technical literature is available on the following aluminum finishing operations; etching, cleaning, desmutting, brightening, barrel finishing, deoxidizing, paint preparation and paint stripping. The chemicals available are said to give better results, shorten maintenance time, and reduce operating costs. Send for free technical literature Dept. 3035 Wyandotte Chemicals Corp., Wyandotte, Michigan.

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Automatic paint finishing systems are engineered to finish completely from start to stop. Whether your job is to be flow-coated, dip-coated, or spray painted either manually or by electrostatic process, Mahon equipment is claimed to serve you better. Write Dept. MPM for catalog A-657 The R. C. Mahon Co., Detroit 34, Mich.

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A new, all-steel standard building for industrial sites is described in a new 8-page brochure just released.

Designed for swift erection, the new building features pre-engineered sections that can be fitted together in a wide variety of building types and sizes. Available widths range from 32′ on up to 48′, and heights reach to 12′, 14′ or 16′. Because of its "erector set" construction, length is limited only by site restrictions.

For further information write Dept. MPM, Truscon Steel Division, Republic Steel Corporation, Youngstown, Ohio. Ask for Brochure K-122.

STRAN-STEEL CATALOG LISTS NEW ARCHITECTURAL PRODUCTS

New wide-flange shapes, 10″ and 12″ joists with 3″ flanges have been added to the line of steel architectural products manufactured by Stran-Steel Corporation. The products are presented in a new catalog just published by the corporation.

The catalog contains complete technical information relative to Stran-Steel's line of joists, studs, channels, ribbed decking and metal curtain walls.

The catalog is available free by writing Dept. MPM, Stran-Steel Corporation, Detroit 29, Michigan.

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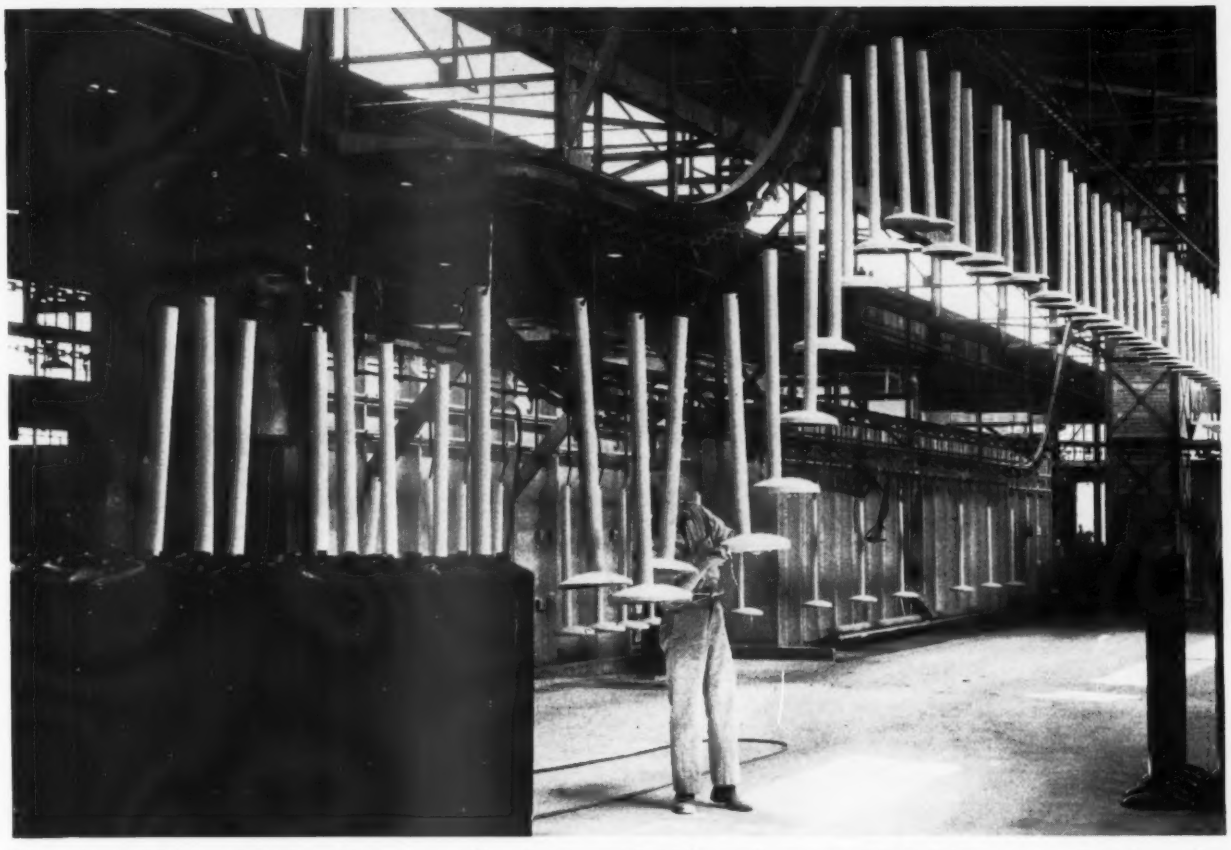


View of new 95-ft. straight-through type enameling furnace with 30-ft. pre-heat zone, 35-ft. firing zone, and 30-ft. cooling zone. Furnace is gas-fired, with oil standby.

Production of glass-lined water heaters at Mission Appliance Corporation

Inert gas welding, die penetrant inspection, liquid cleaning, automatic spraying of porcelain enamel, and electrostatic paint spraying are among the features described

by Gilbert C. Close • WESTERN EDITOR

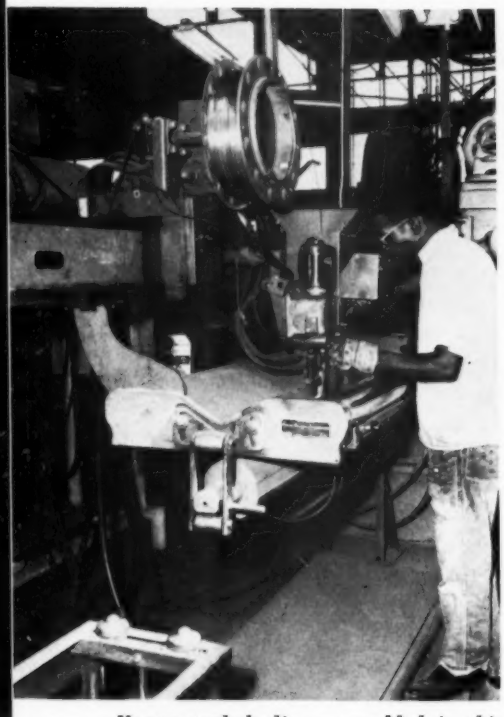
MPM FEATURE

THERE ARE THREE distinct features of the glass-lined water heater tanks at Mission Appliance Corporation, Hawthorne, California. First, straight-line material flow, involving a minimum of handling, is accomplished from raw stock storage to fabricated tank. Secondly, automated processes have been incorporated in the production line wherever practical. Third, the degree of precision maintained all along the line is outstanding for this type of production work.

Raw material for the tanks is purchased directly from the mill to Mission Appliance specifications. This is hot rolled steel, ranging from ¼" to 13 gauge, and adaptable for porcelain enameling. The material arrives on pallets ranging from 7,000 to 10,000 pounds each, and is stored on these pallets in a shed just opposite the doorway of the shearing department. When stock is needed for shearing and piercing, it is moved into the department on pallets, thus avoiding individual sheet handling.

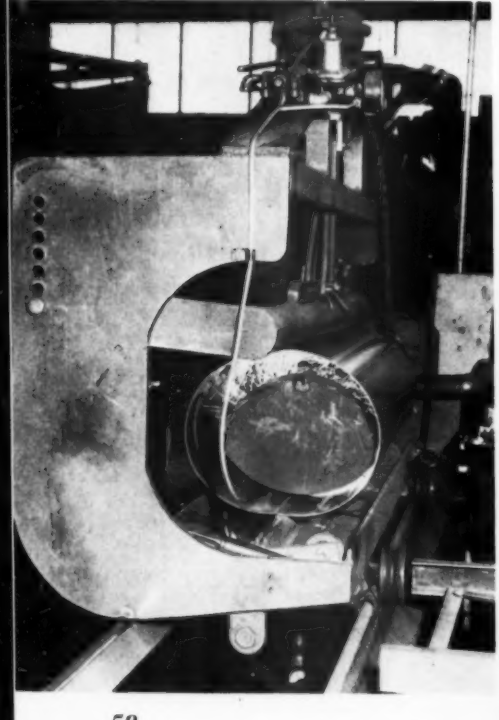
All sheets are sheared or trimmed to remove the raw mill edge. Edges that will be incorporated in a weld seam are sheared to within 1/32-inch tolerance to assure a close edge fit prior to welding. Conventional draw and blanking presses are used for producing both tank and jacket tops and bottoms. A special joggle die mounted in a press is employed for the heat baffle that mounts in the heater flue. Producing this baffle is a one-press-stroke operation and much faster than twisting the baffle into shape. There is also less danger of metal failure than when employing the twist-forming operation.

After shearing to size, the tank body sheets are formed in an automatic true-circle roll. The formed tank bodies are



Heater tank bodies are welded in this automatic submersion arc seam welder. Back bar in welder contains slot which is filled with inert gas to prevent weld oxidation on underside of seam.

Below: Interior of weld seam on tank body is ground on this reciprocating belt grinder to provide smooth interior surface, and facilitate trouble-free enameling.



ejected from the roll onto an apron where they are immediately tack welded. The tacked bodies then move to an automatic, submerged arc seam welder. This seam welder is equipped with pneumatic holding fingers which grip the tank body sheet firmly along each side of the weld seam and press the edges together so tightly that a very slight metal upset occurs. This assures an optimum weld joint seam. This welding machine is equipped with a hollow back-up bar so that inert gas can be fed into a groove just under and parallel to the weld seam. The weld area is thus completely surrounded by inert gas, with no possibility of oxide formations and inclusions which might result in a weak or leaky weld seam.

Immediately after welding, the tank body weld seams are inspected with a dye penetrant solution. This is a double-check on weld seam quality. The weld seam is then ground smooth in a company-designed weld seam grinder.

Next, the tank heads are pressed into place and welded on a circumferential welder. The flue is submersion arc welded to the tank bottom, and this remains as a seperate sub-assembly until after application of the glass tank lining. Spuds are hand-welded on the tank body, but are press-welded on the head prior to its assembly with the tank body. This press welding operation is accomplished on a 400 KVA press welding machine, and produces a very clean, high quality weld.

At this stage of production, both the tank bodies and flue and bottom assemblies are ready for cleaning.

Liquid cleaning instead of blasting

The cleaning of tanks prior to finishing for glass-lined hot water heaters at Mission Appliance deviates in two respects from the conventional. . . . (1) no abrasive cleaning of any type is employed; (2) a high-efficiency boiler incorporating a closed, superheated water system is used for solution heating.

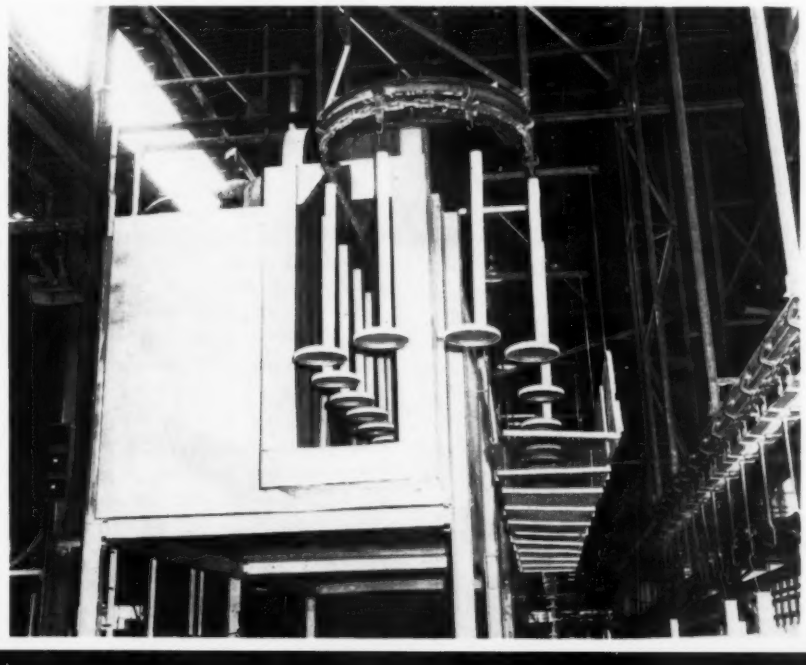
The cleaning department itself contains two rows of five tanks each, serviced by a U-shaped overhead conveyor and traveling monolift hoist. Each tank is 5′ wide, 10′ long and 7′ deep, and each is equipped with its own temperature indicator and temperature control system. The work racks are appropriate to tank size and specifically designed for loading the tank bodies and flue and bottom assemblies.

The tanks in order of their use are . . . . . two caustic wash tanks operated at a rolling boil; warm water rinse; two sulphuric acid pickling tanks operated at 160° F.; cold rinse, nickel strike, hot water rinse, neutralizer, and dry-off tank. The various solutions are maintained by titration. Cleaning cycles are automatically timed and not left to the discretion of the operator.

"After passing through this cleaning system, our tanks are so clean you can wipe them with a white glove without picking up any soil," a Mission Appliance engineer said. "No microscopic grit or abrasive dust is present on the surfaces. We largely attribute our low post -enameling rejection rate to our cleaning methods."

An 85 H.P. high-efficiency boiler is

Flue assemblies emerge from 35-ft. drying oven. Parts make three passes through oven, totalling 105 ft. of travel.



used to heat the tanks. A "closed" hot water system is employed. The water is heated under sufficient boiler pressure so that it becomes superheated instead of generating steam. Temperature of the water ranges from 350 to 400° F.

These closed hot water systems have several advantages. First, the superheated water can be conducted through piping with less insulation (or no insulation for short pipe runs) than steam pipes, and with minimum heat losses, thus decreasing the cost of the installation while maintaining its efficiency. Secondly, because superheated water rather than steam is used, there is no evaporation or condensation loss, and constant addition of water to the boiler is not necessary. Finally, because the same water is constantly circulated through the system, it becomes, in effect, "distilled" after a few circulations, and thus keeps interior scaling of both boiler and pipes at a minimum.

This boiler has been in operation for several months at this time, is fully automatic, and requires no more than routine maintenance attention. The dry-off tank is gas-fired.

After the heater tanks and flue and bottom assemblies have passed through the cleaning system, they are ready for application of the glass lining.

Enameling glass-lined water heaters

Though Mission Appliance has been producing glass-lined water heaters since 1955, up until recently the tanks were lined by a subcontractor. But early in 1957, a 95 foot long, straight-through type enameling furnace was installed. Today, the company is glass lining its own tanks at the impressive production rate of 10,000 glass-lined water heaters a month.

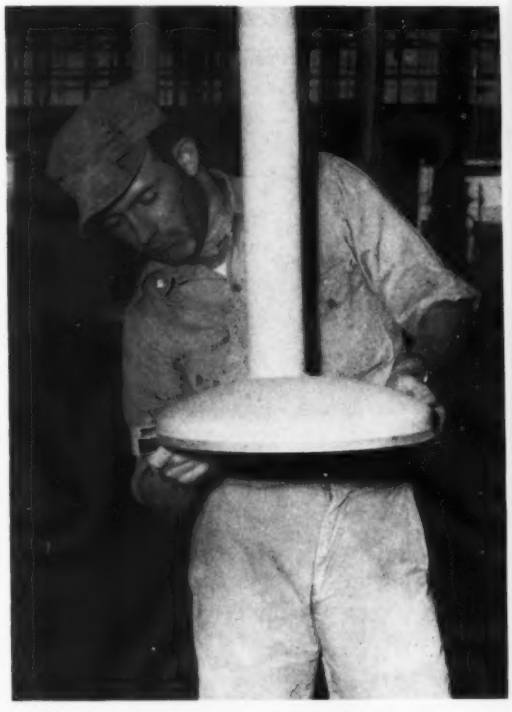
After the tanks and flue and bottom assemblies have been cleaned, they move into an automatic booth for application of the slip. Here automatic spray machines are used for both the tank bodies and flue and bottom assemblies. Wet interior coatings are approximately 0.015 inch thick; exterior coatings are very light. After drying, the interior coatings range between 0.007 and 0.008 inch in thickness.

Beyond the booth, the tanks and flue and bottom assemblies are hung on a 510 foot overhead conveyor which travels through the drying oven. This is a 35 foot oven, operated at 350° F. The heater components make three passes through the oven, totaling 105 feet of oven travel.

The drying oven is heated by a gas burner installed at the top. The hot gasses are fed down through ducts that form the oven sidewalls, then up through 7-inch floor holes immediately below the conveyor line. These holes direct the hot air up into the tank interiors, thus speeding the drying operation. The overall temperature of the drying oven is adjusted so that the water in the applied slip never reaches a boiling temperature. This prevents steam formation which might cause enamel defects.

When the conveyor emerges from the drying oven, it parallels the furnace conveyor for a distance to facilitate mechanical transfer of the components to

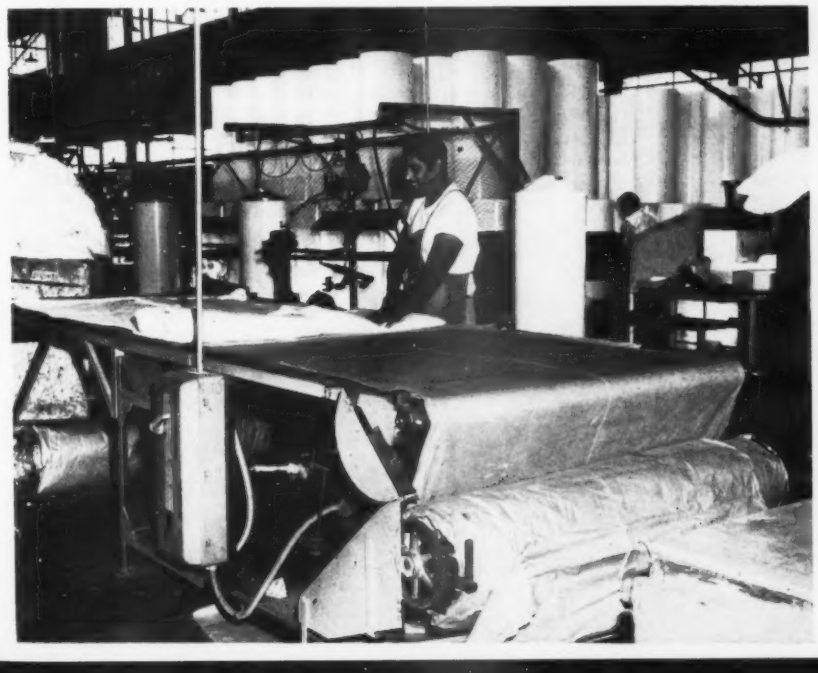
to Page 81 →



The bisque enamel is brushed away for 1/2-inch on flange around heater body bottom to provide bare metal for welding. Enamel, above brushed section, fuses with that on interior of tank.

Below: With carton in place, heater moves on to next packaging phase, passing over gluing rolls onto folding bars.

This table automatically measures out the pre-cut insulation blankets by rolling the backing paper onto the roll. Microswitch stops unrolling action.



REPORT NO. 2 / ON LOWERING TODAY'S COST OF PRODUCTION

Improved electrocleaning of recesses and low current density areas

Controlling foam, lengthening solution life

Despite careful racking and well-planned production, deep recesses and places of normally low current density on intricately shaped parts are always trouble spots.

Diversey electrocleaners were specially fortified with exceptionally high wetting and emulsifying powers to do an effective job at those "problem places." This chemical cleaning supplements high current carrying capacities to give more efficient cleaning in a shorter time. Work emerges waterbreak-free and smut-free, ready for subsequent baths.

You can also depend on Diversey electrocleaner solutions for longer-lasting cleaning power. Greater contamination capacity enables you to use solutions long after ordinary solutions have to be dumped because of heavy soil accumulations.

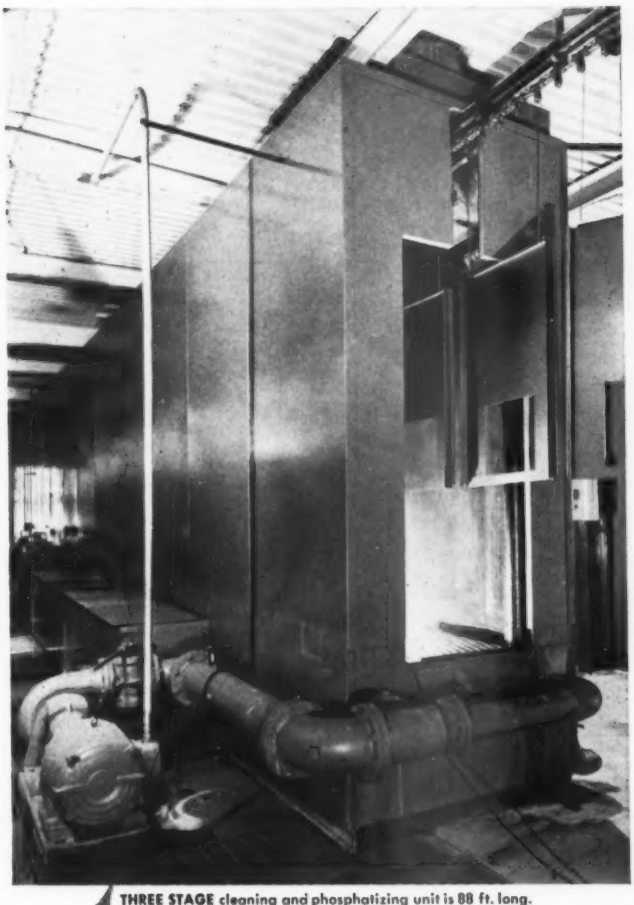
Controlled foaming is an added safety feature of Diversey electrocleaning. The limited foam blanket serves as a safeguard against explosion dangers even in those occasional cases where current density is stepped up to speed production. When used according to recommendations, Diversey electrocleaners operate safely through a wide range of current densities . . . always exhibiting a high, stable conductivity.

WRITE TODAY FOR YOUR FREE COPY OF THIS NEW BOOKLET

Metal Industries Div.
The Diversey Corp.
1820 Roscoe St.
Chicago 13, Ill.

PLANTS IN CHICAGO, NEWARK AND SOUTH GATE, CALIFORNIA. WAREHOUSES IN PRINCIPAL CITIES.

DIVERSEY. ELECTROCLEANING



THREE STAGE cleaning and phosphatizing unit is 88 ft. long. Here, metal parts are detergent-washed, chemically treated to convert the surface of the metal to an iron-phosphate coating, rinsed and sprayed with a dilute chromic, phosphoric acid solution. The phosphate coating prevents rust and corrosion from creeping under paint at points of future wear or damage. The chromic film over the phosphate structure prevents possible oxidation.

DESPATCH

finishing equipment helps Mueller Climatrol make a fast switch from

TWO SHIFTS TO ONE SHIFT

with no lost production!

Painting was a bottleneck at the Mueller Climatrol Division, Worthington Corporation, Milwaukee, Wis.

They had to run two shifts, each 50 hours a week, and had a hard time keeping up on furnace casings and an increasing amount of air conditioning components.

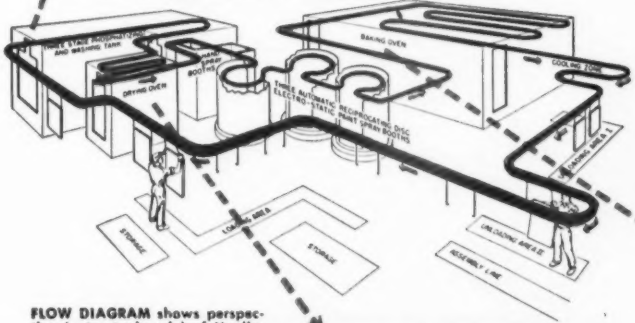
Now they're running one shift, 40 hours a week, thanks to a new system (see flow diagram) that was put into action smoothly and quickly with no lost time . . . no lost production.

Despatch helped by designing and fabricating the washing and phosphatizing machine . . . the gas-fired dry-off oven . . . the spray booth enclosures . . . and the giant baking oven.

Despatch can help you. There's a Despatch-trained resident engineer near you. Why not talk to him about your finishing requirements?

Write today for Bulletin 51

16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.



FLOW DIAGRAM shows perspective (not actual scale) of Mueller Climatrol's new metal processing and paint finishing conveyor system. Conveyor is 1300 ft. long; travels 15 ft. per minute. Parts are completely processed through entire system in one hour. Now, 10 men in 40 hours a week do what 24 men used to do in 50 hours.

DRY-OFF OVEN is gas fired. All moisture is baked out in three passes at 200° F., for three minutes. Parts move from here through hand spray operation (required on only 1% of the jobs) to automatic electrostatic spray booths where all colors of paint, including black and aluminum, are applied.

DESPATCH OVEN COMPANY

619 S. E. Eighth St., Minneapolis 14, Minn.

Sales and Service in All 26 Principal Cities

BAKING OVEN is located outdoors adjacent. There wasn't enough floor space or ceiling height in the finishing department. 300 ft. of conveyor in the gas-fired oven gives a 20 minute bake in five passes. Temperature is automatically controlled, recorded and maintained at 310° F.

DESPATCH . . . PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

DRAWING COMPOUNDS BY KERNS

If you are having drawing problems in your fabrication department contact Kerns. A Kerns *technical service* representative will be pleased to help you smooth out your production operations; and he has a *complete line* of drawing compounds* to rely upon.

As manufacturing chemists and producers of *specialized* compounds, we offer our *technical services* to the appliance and fabricated metal products field. Phone for a personal contact or mail the details of your problem to our Technical Service Department for *quick action.*

*Including the famous "DRY-FILM"®

PRODUCERS OF: Drawing Compounds—Cutting Compounds—Forging Compounds—Grinding Compounds—Phosphatizing Compounds—Wire Drawing Compounds—Rope and Twine Compounds—Cleaning Compounds—Cling Oils—Rolling Oils—Rust Preventives—Wire Rope Lubricants—Specialized Greases—Spray Booth Compounds.

QUALITY & SERVICE

L. R. KERNS COMPANY
2659 East 95th Street Chicago 17, Illinois
Subsidiary Plant
KERNS PACIFIC CORPORATION
630 N. Batavia Street Orange, California
Offices in principal cities throughout the U. S. A.

AIR CONDITIONING & REFRIGERATION SHOW TO BE BIGGEST EVER

Companies readying record-breaking $5,000,000 equipment display, largest ever assembled anywhere, for Air Conditioning & Refrigeration Show at Chicago in November; 7,500 pieces of equipment to be shown according to Air Conditioning & Refrigeration Institute.

NARDA GROUP OFFERS APPLIANCE SERVICING CLASSES

Training classes on appliance repair and service, sponsored by Bakersfield, Calif. Radio-TV-Appliance Dealer's Association, have begun, President Howard Welty announced recently.

According to Welty, enrollment in the classes is open to dealers and servicemen in the area, and there is no tuition cost. The courses are approved by Bakersfield College.

Welty announced that the training program lectures will be given each Wednesday night, from 7 to 10 p.m., in Room 4 of the Trades and Industrial Building of Bakersfield College.

CRIBBEN AND SEXTON BUYS MAGIC CHEF RANGE OPERATION

Magic Chef, Inc., the manufacturing division of the newly merged Magic Chef-Food Giant Markets, Inc., has announced the sale of its commercial range operation in Cleveland, Ohio to Cribben and Sexton Company of Chicago.

The purchase includes tools and dies, special machinery for the production of heavy-duty ranges, and the raw material and finished goods inventory. The purchase price was not disclosed.

NORGE NAMES VICE PRESIDENT AT MUSKEGON, MICHIGAN OPERATIONS

The appointment of Kenneth E. Anderson as vice president was announced by Judson S. Sayre, president of Norge Division, Borg-Warner Corporation, Chicago. He is general plant manager of Norge operations at Muskegon, and Muskegon Heights, Mich.

Anderson reports to V. C. Rice, vice president in charge of all Norge manufacturing and engineering. He will continue to be in charge of the refrigerator and home freezer, aircraft, and factory parts service plants.

Anderson has been associated with Norge for the past 22 years in various inspection, quality control, service, and manufacturing positions. He assisted in the establishment of the Herrin, Illinois washer plant in May, 1946. From 1949 until 1952 he was assistant plant manager of the Effingham, Illinois range and dryer plant.

HEINTZ MFG. DIVISION OF KELSEY-HAYES

The manufacturing operations of Heintz Manufacturing Company of Philadelphia, Pa., are now being conducted at "Heintz Division, Kelsey-Hayes Company", it was announced. As part of the transaction consummated recently, Kelsey-Hayes assumed all of the commitments and obligations of Heintz under existing contracts with customers and suppliers. The Heintz management will continue to operate the Heintz Division of Kelsey-Hayes in Philadelphia.

VACUUM CLEANER PRODUCER PREDICTS BIG FOURTH QUARTER

Sales for the vacuum cleaner industry for the last quarter of 1957 will increase over the same period last year by about 25 per cent, according to an optimistic prediction made by Henry Dorff, vice-president in charge of sales and merchandising for the Lewyt Corporation, upon his return from a series of regional meetings with the company's vacuum cleaner distributors.

"We just completed one of the best summers the company has had in two years," Mr. Dorff said. "Our sales were up 27% for June, July and August over last year. The increase was due to full use by distributors and dealers of our promotions, and our fall program calls for even greater promotion and merchandising activities."

MAYTAG DECLARES DIVIDEND

The board of directors of the Maytag company declared a 75-cent regular quarterly dividend on Maytag $3 cumulative preference stock, payable November 1 to shareholders of record at the close of business October 15.

50 PER CENT RETAIL INCREASE FOR CARRIER

A 50 per cent increase in room air conditioner retail volume has been achieved by Carrier Corporation in 1957 despite a slight drop in sales of this product for the entire industry, Cloud Wampler, chairman of the board of Carrier Corporation, declared.

The Carrier chief executive spoke to more than 200 representatives of the nation's leading appliance and department stores and some 75 key distributors at the introduction of 1958 room air conditioner models.

He predicted his company would continue to expand its share of the retail market which he estimated at 1,750,000 units for the industry in 1958. Current forecasts are that about 1,550,000 will be sold during the current 12 months' period compared with 1,600,000 in 1956.

GOV. CLEMENT WELCOMES MAGIC CHEF TO TENNESSEE

Governor Frank G. Clement welcomed the Magic Chef sales organization to Tennessee, opening a two-day convention of the entire sales organization, September 12 and 13. The nationally known manufacturer of gas ranges and space heaters recently moved its executive headquarters and manufacturing operation from St. Louis, Mo. to Franklin, Tennessee.

DEHUMIDIFIER SALES EXPECTED TO REMAIN FIRM

At a time when the appliance industry is hampered by over-production,

there is one appliance which is actually in short supply in some areas.

This is the dehumidifier which this year will approximately hold the unit volume record-high peak achieved last year, according to J. W. Alsdorf, president, Mitchell Manufacturing Company.

"Not only are dehumidifiers in short supply in some areas around the country, but some manufacturers are out of stock in certain models of dehumidifiers," says Alsdorf.

Alsdorf expects the industry to finish 1957 with 250,000 sales. This will approximate the record high 275,000 of last year when the industry nearly tripled any previous year's unit sales.

This is particularly significant in a year when most of the products in the appliance industry are experiencing a state of over-production.

COONS NAMED GAMA PRES.

Clifford V. Coons, executive vice president of Rheem Manufacturing Co., New York, became president of the Gas Appliance Manufacturers Association recently in St. Louis.

Coons succeeded Julius Klein, president of Caloric Appliance Corporation, Philadelphia, as head of the association whose 561 member companies produce more than 95 per cent of the nation's output of gas appliances and equipment.

Edward A. Norman Jr., president of Norman Products Co., Columbus, Ohio, became first vice president. Second vice president is Wendell Davis, president of Cribben & Sexton Co., Chicago, and treasurer, for a second time, is Stanley H. Hobson, president of Geo. D. Roper Corp., Rockford, Ill.

Chairman of GAMA's twenty product divisions were installed at a meeting of the trade group's board of directors. The new division chairmen are: Automatic Controls Division, S. L. Kile of Baso, Inc., Milwaukee, Wisc.; Direct Heating Equipment Division, E. M. Douthat Jr., Locke Stove Co., Kansas City, Mo.; Domestic Gas Range Division, J. P. Wright, Florence Stove Co., Chicago, Ill.; Gas Appliance Regulator Division, Wayne H. Schutmaat, Pen Controls, Inc., Goshen, Ind.; Gas Boiler Division, E. T. Selig, Burnham Corp., Boiler Division, Irvington, N.Y.; Gas Clothes Dryer Division, John W. Benson, Whirlpool Corp., St. Joseph, Mich.; Gas Conversion Burner Division, H. P. Mueller Jr., Mueller Climatrol Division, Worthington Corp., Milwaukee, Wisc.; Gas Furnace Division, Edward P. Hayes, The C. A. Olsen Mfg. Co., Elyria, Ohio.

MAGIC CHEF SALES UP

Magic Chef's domestic ranges are being produced at Franklin, Tennessee. Shipment of ranges during August set a new record for the plant, according to Cecil M. Dunn, President of Magic Chef-Food Giant Markets, Inc. He predicts even greater sales increases once the 1958 Magic Chef line is unveiled at the Merchandise Mart in January. The '58 line will include new popular-price models to appeal to a broader segment of the market, he said.

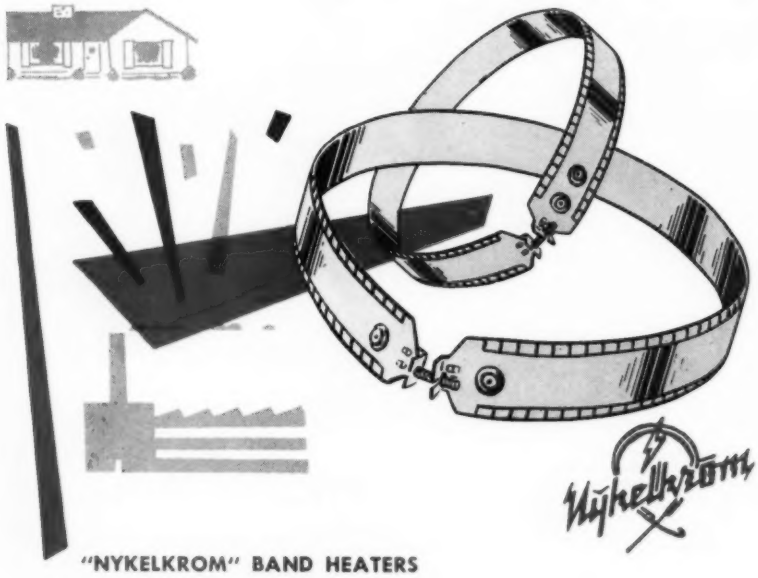
AMCA ELECTS NEW DIRECTORS

Nine new directors were unanimously elected by members of the Air Moving & Conditioning Association (AMCA) at its third annual meeting, September 17-19, at the Greenbrier, White Sulphur Springs, West Virginia.

YOUNGSTOWN KITCHENS INCREASES SALES STAFF

Youngstown Kitchens Division of American-Standard will increase its field sales staff and has established six major sales divisions throughout the United States and Canada. These are among organizational changes announced by M. L. Ondo, v. p. of sales.

Harry F. Howell, who formerly held



"NYKELKROM" BAND HEATERS

Flexible NYKELKROM Band Heaters are shipped to the user flat so he may shape them exactly to his own requirements. They apply heat directly and efficiently to flat or irregular surfaces. Tensioning devices furnished with heater for mounting to circular shape.

Nickel-chromium resistance wire, mica insulation and aluminized steel case assure long life and quick heat transfer. Lengths, widths and wattages for all applications either household or industrial. Choice of termination . . . one end or both ends.

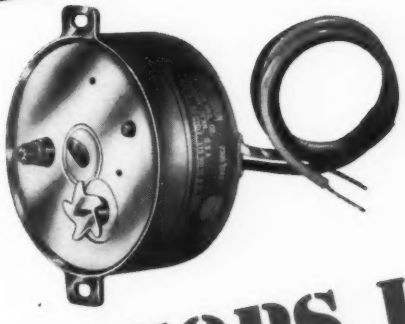
Write for descriptive literature. Special sizes and construction upon request.

H. W. TUTTLE & CO.
Adrian, Michigan

Manufactured and distributed in Canada by CRONAME (Canada) Ltd., Waterloo, Quebec

Tuttle of Adrian

RANGE TIMER TROUBLE



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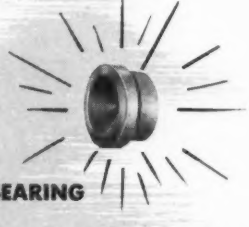


THE MIRACULOUS LUX "LUBE-LESS" BEARING

Here's the point where other timers *"gum up"*, stop and headaches step in on major appliance dealers.

Lux Timers can't "gum up" because the improved synchronous motor features an exclusive bearing requiring absolutely no lubrication—

Stop trouble before it starts. Mail coupon today or phone us collect.

LUX CLOCK MFG. CO.
DEPT. MP, WATERBURY, CONN.

I'll take you up on your offer. Rush me full Lux timer details.

Name .....
Title .....
Company .....
Street .....
City ..... Zone ..... State .....

THE LUX CLOCK MANUFACTURING CO., INC.

WATERBURY 20, CONNECTICUT

the title of sales manager, has been named general manager of sales. He will direct the work of six divisional managers to whom regional managers and factory branch managers will report.

The divisions and managers are: Eastern, J. R. Miller, formerly manager of appliance sales; Midwest, D. F. Sembach, formerly manager of dealer sales; Central, D. R. Boehm, Jr., formerly a regional manager; Southern, J. C. King, formerly manager of builder sales; Canada, Gage Campbell, who continues to direct Youngstown Kitchens sales in the Canadian market.

NEW ALUMINUM SANDWICH PANEL FOR PRE FABS

The development of experimental roof and wall panels that "open up an entirely new concept in the mass production of housing components" was revealed by National Homes Corporation.

Described as a "sandwich" panel, the component consists of a .016-inch aluminmum skin bonded to a back-up material which, in turn, is bonded to a core.

The function of the metal skin is to carry the imposed load, whether in bending, compression or tension; the back-up material, to restrain the expansion and contraction of the skin and to provide resistance to localize impact and shock; and the core, to stabilize the facings against buckling.

CASTER SOCKETS

.... The TREND TODAY is to ROLL AWAY!

Danielson caster sockets can make mobility an attractive added feature of your appliance.

Send for sample and price of the one you can use or let us quote on your special requirements.

We can supply you with casters, too.

V. W. DANIELSON
MANUFACTURING COMPANY
3364 W. HOPKINS ST., MILWAUKEE 16, WISCONSIN

Write, phone or wire, today!

NATIONAL SAFETY COUNCIL RECEIVES PMI AWARD

The National Safety Council has been selected by the Pressed Metal Institute to receive the Presteel Award of 1957. It was presented October 16 at the annual convention of PMI in Bermuda.

The Council was chosen for the honor because of its "outstanding job in reducing the pressed metal industry's accident frequency rates," the award committee said.

"The Council's efforts," said Carter C. Higgins, president of Worcester Pressed Steel Co. and spokesman for the award committee, "have been of substantial value to our industry."

REMINGTON RAND AND HAUSERMAN ADOPT CO-OP MARKETING PLAN

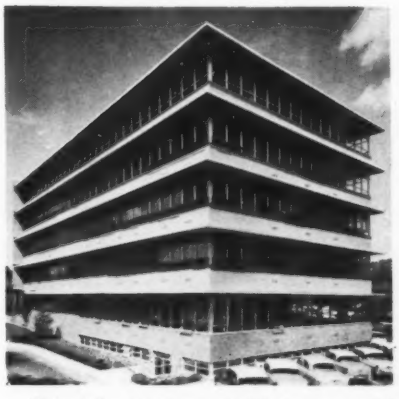
A novel marketing plan has been adopted by the Remington Rand Division of Sperry Rand Corporation, New York City and The E. F. Hauserman Company, Cleveland, Ohio.

The plan will bring the technological know-how of Hauserman into play to

back-up Remington Rand's efforts to merchandise "packaged offices". At the same time, it will widen Hauserman's market for its products, prefabricated office partitions.

PORCELAIN ENAMEL IN ANTIQUE GOLD FINISH FROM CALORIC

The Architectural Porcelain Enamel Division of Caloric Appliance Corporation announced today the availability of an Antique Gold porcelain enamel finish. The metallic gold is a color and finish that the industry has been attempting to achieve for years.



Caloric's Antique Gold is textured to give a rich, distinctive finish to the material which, at the same time, retains all the durability and ruggedness required for porcelain enamel curtain wall construction.

A spokesman stated that Caloric's expanded Architectural Porcelain Enamel Division can supply the Antique Gold panels for immediate delivery in any quantity, fabricated to the architect's or builder's specifications.

LEWYT INTRODUCES NEW VACUUM CLEANER

The Lewyt Corp. has announced that it is introducing "the world's first hi-compression, automatic vacuum cleaner."

The unit, which retains the big wheels of a model introduced by Lewyt in 1954, has been inspired by today's trend for automatic appliances, a company spokesman said.

According to Henry Dorff, vice-president in charge of sales and merchandising, the new model has been designed and engineered to provide a minimum of effort in cleaning. An automatic power dial sets the required suction with about the same physical effort required for a steam iron. The cleaner has a 750-watt motor and several important mechanical improvements over other Lewyt units.

NEW EXECUTIVES GREETED AT ANNUAL MEETING

Die casting company representatives from coast to coast gathered at the 1957 Annual Meetings of the American Die Casting Institute recently at the Edgewater Beach Hotel in Chicago and greeted the newly-elected officers of this national association of custom die casters. The new officers are policy-making executives with practical experience.

Clifford J. Sheehan, Eastern Sales Manager, Die Casting Division, Aluminum Company of America, Garwood, N.J., was re-elected President of the Institute for the 1958 term. Clifford L. Anthony, Works Manager, The Hoover Company, North Canton, Ohio, was re-elected as Vice-President. David Laine and W. J. Parker, American Die Casting Institute, were re-elected Secretary and Treasurer, respectively.

The presentation of the Annual Doehler Award, highest honor of the die casting industry, to James N. Smith of the Aluminum Company of America was the highlight at the banquet which closed the 1957 Annual Meetings.

LIGHT METALS CORPORATION CREATES NEW PRODUCTION ECONOMIES WITH *Extruded Aluminum*

To reduce initial design cost & eliminate capping problems, we can end-close extrusion shapes . . . economically.
cross section

Background illustration shows you how this trim part on a freezer cabinet is fully utilizing the latest developments in connection with extruded aluminum. The blown up inset gives you a better view of the end-closure.
We think its important that every one at all concerned with the designing and manufacturing of an end product should know about these new features:

1. END-CLOSURE is our own development and we are now able to close the ends of almost any extruded shape. The contour of the closure is limited only by our imagination. It gives you a beautifully smooth end . . . absolutely free from any damaging jagged, sharp or pointed ends.
2. SIMULATED CHROME FINISH. The above illustrated job demanded a very bright finish. With the new Bright Metal 6463 Alloy and with buffing and anodizing we produced a part that the average layman cannot tell from a chrome plated job. It's less money and it's much more permanent. This chrome like finish is a wonderful new addition to the many many other colors and textures already available to users of extruded aluminum.

We still have some samples of this job on hand and we would be glad to send one to anyone interested . . . as long as they last.

Just write, wire or phone

LMC **LIGHT METALS CORPORATION**

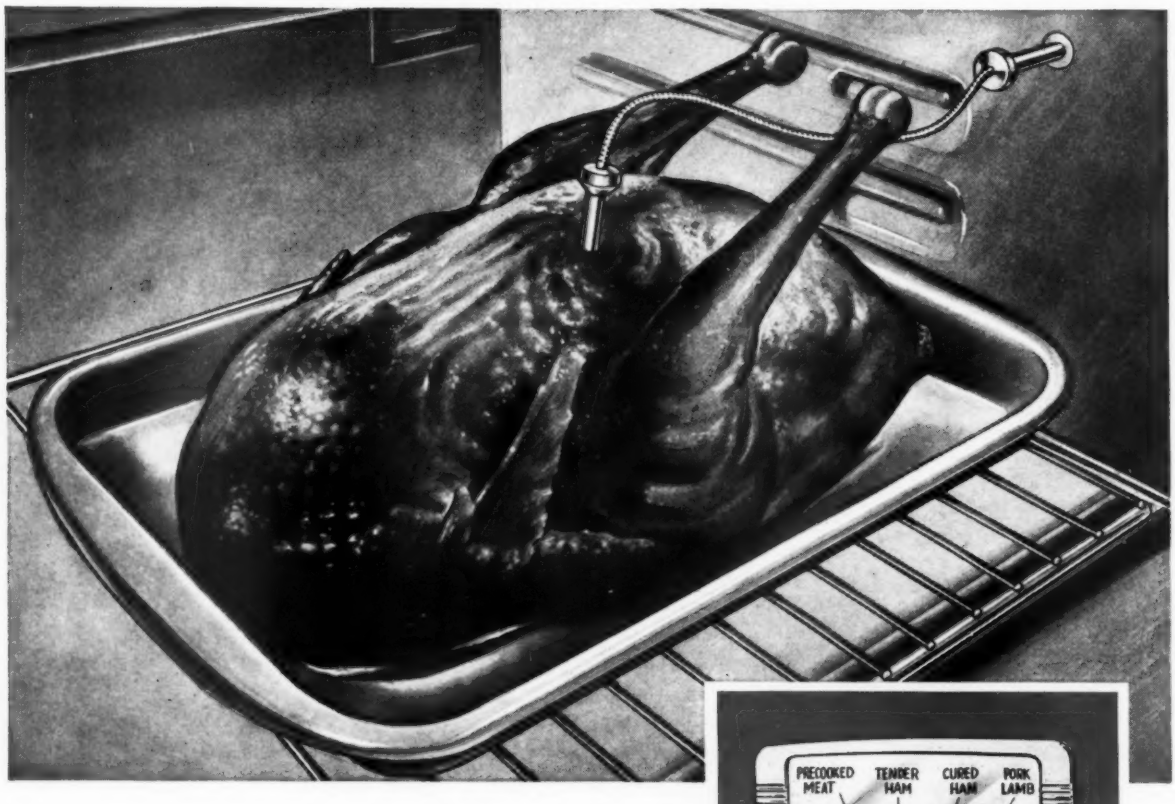
1223 Monroe N.W. Grand Rapids 5, Michigan

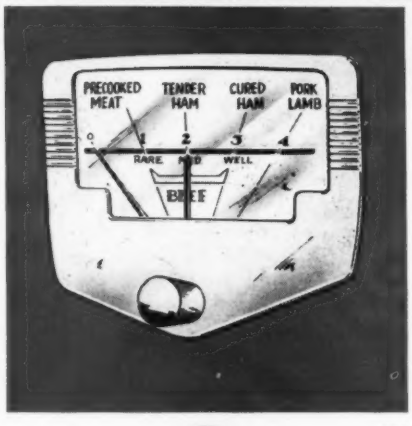
EXTRUDED ALUMINUM - COMPLETE FABRICATION FACILITIES - ANODIZING

CULTIVATE RANGE BUYER PREFERENCE WITH THE NEW K-S AUTOMATED MEAT THERMOMETER

What housewife is not impressed by the assurance that with a new electric range her roasts will come out of the oven done exactly as she had planned? Not just once in a while, but every time!

Give her that assurance by incorporating in your ranges the improved K-S Automated Meat Thermometer.





7939

Features Having Definite Sales Appeal

- A pre-set pointer on the instrument panel dial is adjusted to precisely the degree of doneness desired.
- A second pointer indicates the inside temperature as the roasting cycle progresses. When it reaches the position of the pre-set pointer, the cook is notified by a signal light, chimes or buzzer that the roast is ready to be removed.
- Also, if desired, the oven heating current is cut off at that time.
- The new meat probe has a smaller diameter than the earlier model and is connected to the oven plug jack with a new non-kinking cable to make it easier to use. *Write for quotation on the Improved K-S Meat Thermometer.*

KS

KING-SEELEY CORPORATION

ANN ARBOR, MICHIGAN

INDUSTRY PERSONALS

Robert E. Fleming has been elected executive vice president of the Industrial Heating Equipment Association to succeed Carl L. Ipsen, who retired on September 30. In industry, Fleming was an associate in Machine Steel Products Corp., president of R. Fleming and Company, and partner in Ajax Investment Company.

The appointment of *Charles D. Speier* as vice president and secretary of Seaporcel Metals, New York, has been announced. Speier will continue as director of sales, advertising, and merchandising, a post he has held since he joined the firm in 1955.

Robert L. Tyler, president, Tyler Refrigeration Corp., has announced the appointment of *John C. Oorbeck* as director of purchases to succeed Paul G. Hartzog who will retire next January after twelve years of service. Hartzog will serve as consultant during the interim period.

Oorbeck, for the past nine years associated with Whirlpool Corp., St. Joseph, Mich., will direct purchases of the Niles, Mich. operation. He will also assist purchasing agents at the Tyler, Waxahachie, Texas plant and Wilson Refrigeration, Inc., Smyrna, Del.

SPEIER

OORBECK

William S. Malloy has been appointed to the position of personnel manager of Mueller Climatrol, Division of Worthington Corp., it was announced by Frank J. Nunlist, executive vice president. Malloy joined Mueller Climatrol in 1952 as industrial relations counsel, and later became director of personnel relations, plant personnel manager, and insurance manager.

George A. Lubenow has been named national kitchen appliance merchandiser for Norge Division, Borg-Warner Corporation, Chicago, Walter C. Fisher, general sales manager has announced. Lubenow was formerly divisional sales manager in charge of sales in 20 states for Gibson Refrigerator Co., Greenville, Michigan.

William H. Chase has been appointed director of merchandising for Easy Laundry Appliances Division of the Murray Corp. of America, it was announced recently by Parker H. Ericksen, vice president of Easy and the Murray Corp.

In his new position, Chase will be in charge of all of Easy's national merchandising efforts and will be responsible for developing merchandising events at the retail level, Ericksen said.

Stanley G. Fisher, vice president of sales for Landers, Frary & Clark and subsidiaries, announced the appointment of *Maurice F. Moriarty* as sales manager of the Handy-Hannah Products Corp. with headquarters in Whitman, Mass. In this capacity, he will be responsible for national sales, advertising, and customer relations for all products manufactured by the company.

The appointment of *James P. Butler* as national home laundry appliance merchandiser was announced recently by Norge Division, Borg-Warner Corporation, Chicago.

Walter C. Fisher, Norge General sales

For the name in front...

DIE CAST NAME PLATES

Positive product identification must meet exacting specifications for beauty, durability, and design flexibility. LaFrance specializes exclusively in three-dimensional die cast name plates and decorative trim — with complete design and production facilities. Send for free sample and additional information.

La France PRECISION CASTING CO.

2003 S. 29th Street
Phila. 45, Pa.
HOward 5-7106

manager, said Butler will be on his staff offices in Chicago. He will assist in the administration of sales plans and programs involving Norge automatic and wringer-washers; and gas and electric automatic clothes dryers and water heaters.

The Trane Company recently announced the promotion of *Gene H. Binning* to branch office manager of the firm's Oklahoma City territory. Trane is a manufacturer of air conditioning and heating equipment with home offices in La Crosse, Wis.

Joseph A. Pask, Professor of Ceramic Engineering at the University of California at Berkeley, has been appointed Chairman of the Division of Mineral Technology. The Division includes all of the mineral industry specializations —mining, geological engineering, extractive metallurgy, physical metallurgy, process engineering, petroleum engineering and ceramic engineering — and is part of the College of Engineering.

Parker H. Ericksen, vice president of Easy Laundry Appliances and of the Murray Corporation of America, has been named general manager of the Easy Laundry Appliances division. The announcement was made by B. C. Gould, president of the Murray Corporation.

In his new executive post, Ericksen will have overall responsibility for all departments, including development, engineering, production, and marketing. He will continue to headquarter in the Chicago general offices of the company but will spend considerable time at the Syracuse plant.

Stanley G. Fisher, vice president of sales for Landers, Frary & Clark and subsidiaries announced the appointment of *David C. Doster* as sales manager of the Premium Division of the company with headquarters in New Britain, Connecticut. In this capacity, Doster will be responsible for premium sales of all products manufactured by the company.

Following a special meeting on September 3 of the Board of Directors of Lyon Metal Products, Incorporated, manufacturers of steel shelving, cabinets and lockers, Henry A. Gardner, Chairman, announced that *L. D. Deal* had been elected President to succeed the late H. B. Spackman.

Deal joined Lyon in 1925 as Assistant Auditor. In 1936 he was made Auditor. He was elected Assistant Secretary and Assistant Treasurer in 1941, Secretary and Treasurer in 1950, and in 1951 became a member of the board.

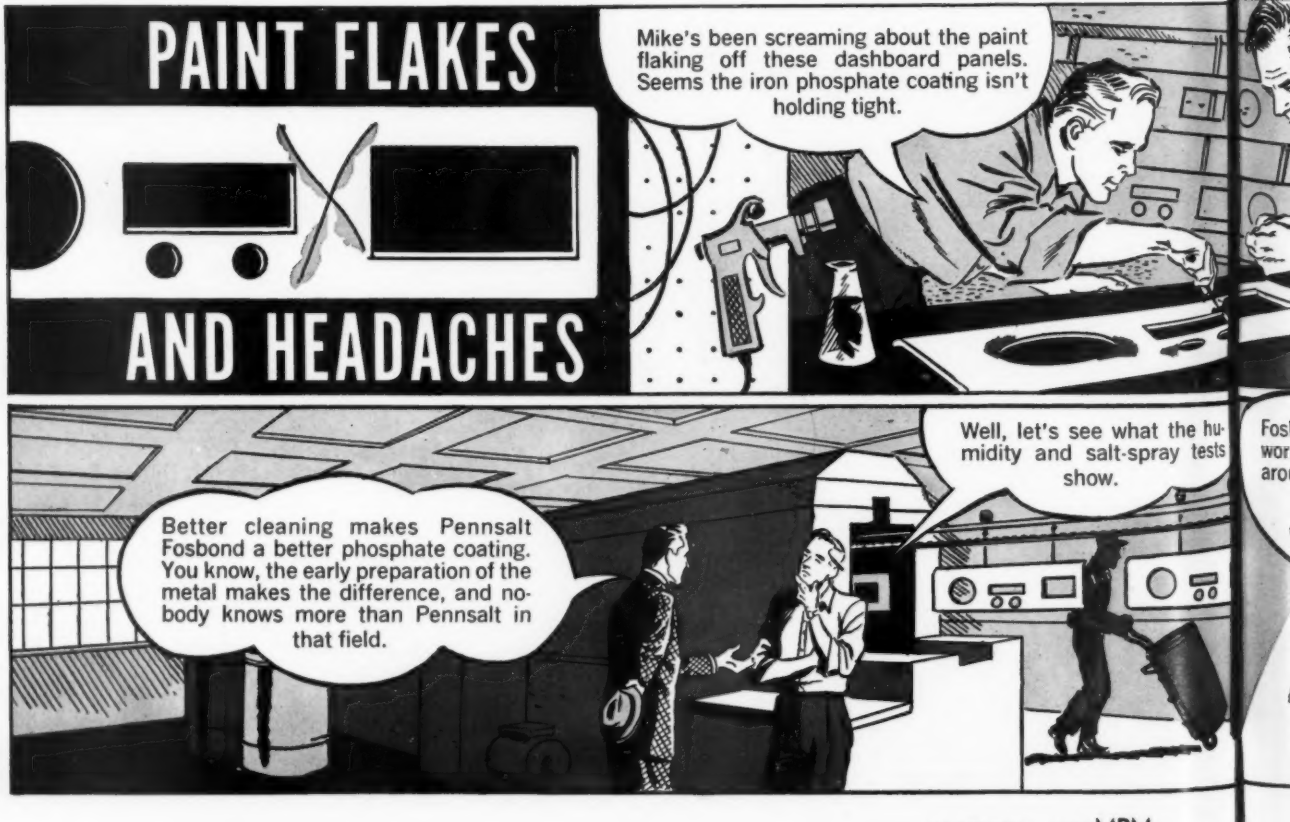
With the top change, the company also announced the election of *A. W. Walan* as Secretary and Treasurer and *J. B. Gossett* as Assistant Treasurer.

Other officers of the company are *J. M. Olesen* — vice president in charge of sales, *O. M. Konrath* — vice president in charge of production, *Neal Ormond* — vice president in charge of personnel relations, and *J. P. Bartsch* — assistant secretary.

Dale O. Akridge has been named Manager, Advertising and Sales Promotion, for the General Electric Company's Television Receiver Department, Syracuse, N.Y. A native of Cincinnati, Ohio, Akridge attended Hope College in Holland, Michigan and the Chase College of Law in Cincinnati.

LaVerne D. Vickers, 40, has assumed duties as administrative assistant to the president of the Maytag company.

Vickers served 2 years in the U.S. air force before retiring July 1 as a lieutenant colonel. His most recent air force assignment was that of chief of the Dallas (Texas) air procurement district. He is a graduate of the advanced management program at the University of Pittsburgh.


PAINT FLAKES
AND HEADACHES
Mike's been screaming about the paint flaking off these dashboard panels. Seems the iron phosphate coating isn't holding tight.
Well, let's see what the humidity and salt-spray tests show.
Better cleaning makes Pennsalt Fosbond a better phosphate coating. You know, the early preparation of the metal makes the difference, and nobody knows more than Pennsalt in that field.

SUPPLIER PERSONALS

Interchemical Corporation has recently announced the following changes, according to Jules L. Bauer, Division vice president and director of sales, Metal Decorating.

Harry Linkletter, a vice president of Interchemical's International Division, will transfer on December 1 to the Finishes Division to assume the duties of assistant director of sales, Metal Decorating.

It was further announced that *William E. Bleier* has become assistant Atlantic District sales manager, Metal Decorating.

Thayer R. Brown becomes manager of Technical Service, Metal Decorating.

The appointments of *Clarence W. Higbee* as assistant general manager, and *Gillette N. Houck* as sales manager, of the newly-established Electrical Conductor Division, Kaiser Aluminum & Chemical Corp., were announced by J. T. Dougall, general manager of the division.

Higbee, a veteran of nearly 40 years in the electrical conductor industry, joined the company earlier this year when Kaiser Aluminum purchased the wire and cable business of the United States Rubber Company.

Houck joined Kaiser Aluminum in 1947 and has held a variety of sales and executive sales positions in Kansas City, Missouri; Newark, Ohio; and Chicago, Illinois, including his most recent post as product manager, electrical conductor products. Prior to that he had more than a decade of sales and engineering experience with Firestone Tire and Rubber Company and Beech Aircraft Corporation.

HIGBEE

HOUCK

The appointment of three new directors and an assistant director in the personal relations division of Armco Steel Corp. was announced recently by R. S. Gruver, administrative vice president in charge of personal and public relations.

The newly-appointed men are *Brookes D. Billman,* director of employee relations; *William T. Maxwell,* assistant director of employee relations; *Earl L. Brooks,* director of employee programs and personnel research; and *William Verity,* director of organization planning and development.

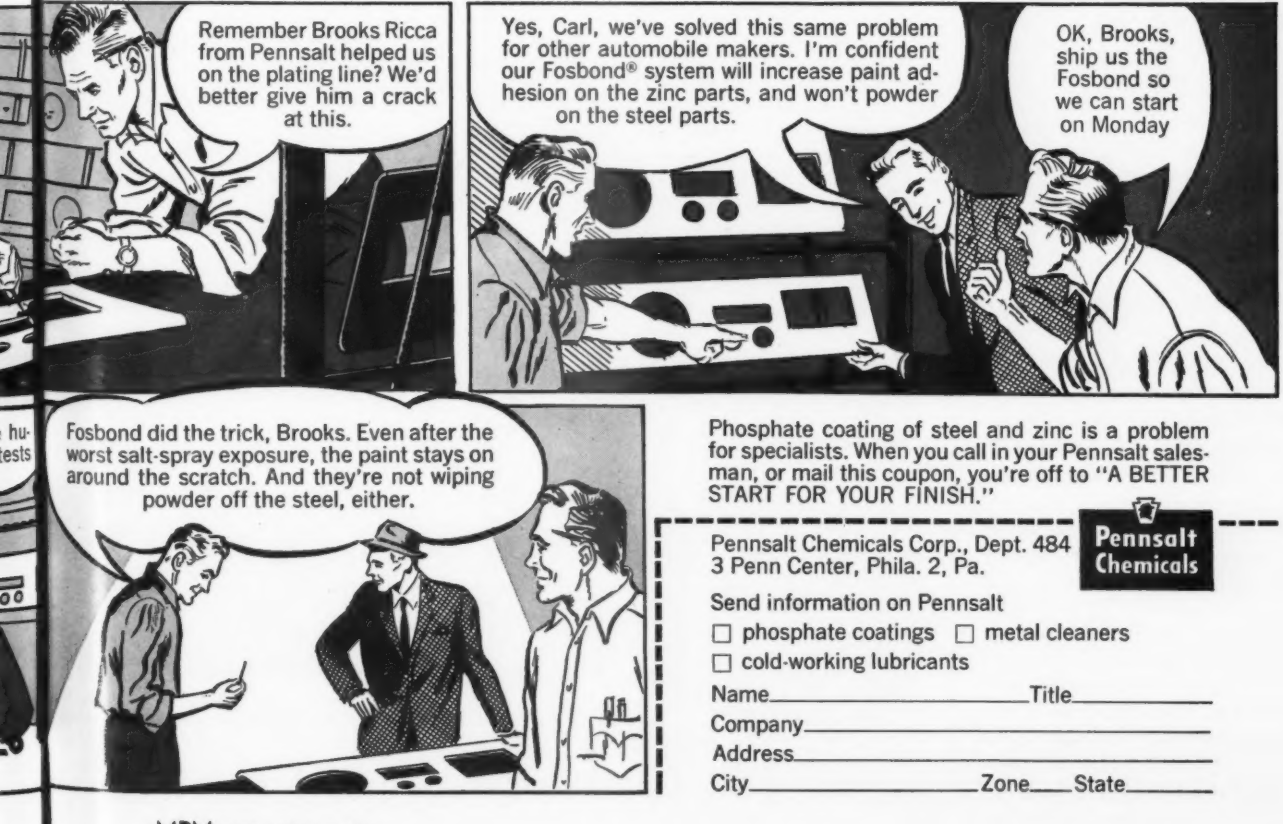
Edward L. Carlson, advertising manager of Oakite Products, Inc., has been placed in overall charge of the company's informational efforts in the industrial cleaning and metal finishing fields.

Carlson, who joined Oakite in 1924 and has served as both copyrighter and production manager, was promoted to advertising manager in 1947. In his new capacity he will supervise the company's activities in industrial trade shows and special promotions, as well as trade paper advertising, direct mail, literature, and publicity.

I. W. Wilson was elected chairman of the board of Aluminum Co. of America, and *Frank L. Magee* was named president, at a recent meeting of the company's board of directors.

The board also elected *Harold C. Erskine* a vice president, and named three

to Page 77 →


Remember Brooks Ricca from Pennsalt helped us on the plating line? We'd better give him a crack at this.
Yes, Carl, we've solved this same problem for other automobile makers. I'm confident our Fosbond® system will increase paint adhesion on the zinc parts, and won't powder on the steel parts.
OK, Brooks, ship us the Fosbond so we can start on Monday
Fosbond did the trick, Brooks. Even after the worst salt-spray exposure, the paint stays on around the scratch. And they're not wiping powder off the steel, either.

Phosphate coating of steel and zinc is a problem for specialists. When you call in your Pennsalt salesman, or mail this coupon, you're off to "A BETTER START FOR YOUR FINISH."

Pennsalt Chemicals

Pennsalt Chemicals Corp., Dept. 484
3 Penn Center, Phila. 2, Pa.

Send information on Pennsalt

☐ phosphate coatings ☐ metal cleaners
☐ cold-working lubricants

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

NEWS about Suppliers

PARKER RUST PROOF OPENS ST. LOUIS PLANT

Parker Rust Proof Company, of Detroit, has announced the opening of a new plant at St. Louis, Mo., its sixth in the United States and Canada. The firm manufactures a line of products for the surface treatment of metals.

Robert W. Englehart, Company President, said the 40,000 square foot structure provides complete manufacturing and warehouse facilities to serve customers in the Midwest, South and Southwest. Located on a 3½-acre tract, the plant is the first to go into operation in St. Louis' newly developed Lindbergh-Warson Industrial Center.

ALLMETAL OPENS NEW MIDWEST DIVISION

Allmetal Screw Products Company, Inc., Garden City, New York, announced the opening of their new Midwest Division headquarters located at 5611 West Lake Street, Chicago 44, the operation is slated to be headed by Mr. Tom Schaid.

MAC DERMID NOW ON COAST

MacDermid Incorporated, Waterbury, Conn. and Detroit, Mich., manufacturer of metal cleaning, plating, and finishing chemicals, recently announced the opening of a West coast division, MacDermid Pacific Incorporated.

Complete manufacturing, warehousing, sales and service facilities are now in operation, the report states. The new division, headed by Claude E. Weekly, former product service engineer, will have its headquarters temporarily located at 18802 Fonthill, Torrance, Calif.

C. W. DEAN AND ASSOCIATES EXPAND LINE OF PRODUCTS

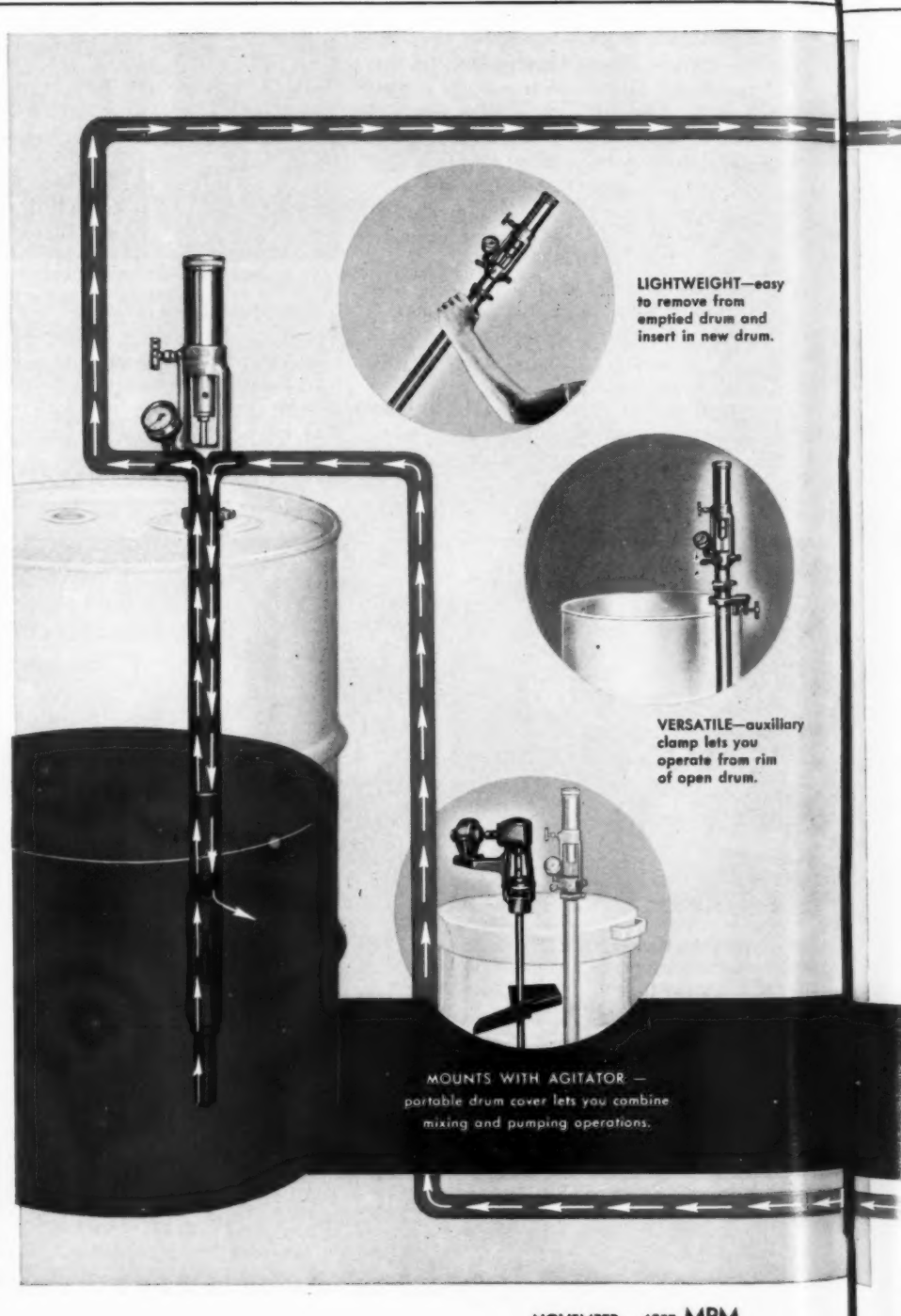
C. W. Dean and Associates, Memphis, manufacturers representatives, have expanded the line of products represented by the firm to include American Air Filter Company's air filter and engine & compressor products. These are in addition to AAF's dust control, Herman Nelson unit ventilator, and Herman Nelson heating and ventilating products, which Dean has represented for years in the Memphis area. The new agreement with American Air Filter became effective October 1.

American Air Filter Company, with Home Offices in Louisville Ky., is a large manufacturer of air filtration and dust control equipment.

NEW GENERAL GASKET PLANT

General Gasket Inc., has announced removal of its manufacturing operations to a larger and more efficient plant at 306 Stack Street, Middletown, Conn.

This step, a company spokesman explained, was necessitated by the growing demand for Color-Plast, and will assure users of faster service on sealing and spacing specialties fabricated from the new material, as well as on sheet stock orders.


LIGHTWEIGHT—easy to remove from emptied drum and insert in new drum.
VERSATILE—auxiliary clamp lets you operate from rim of open drum.
MOUNTS WITH AGITATOR — portable drum cover lets you combine mixing and pumping operations.

AMERICAN CHEMICAL PAINT COMPANY HELD ITS INTERNATIONAL CONVENTION

Thirty-four nations were represented by 77 delegates from Antigua, Argentina, Australia, Barbados, Belgium, Belgian Congo, Brazil, Canada, Chile, Colombia, Cuba, Denmark, Dominican Republic, England, France, Germany, Hawaii, India, Italy, Japan, Mexico, Morocco, Netherlands Guiana, New Zealand, Norway, Panama, Puerto Rico, South Africa, Spain, Sweden, Switzerland, Trinidad, Uruguay, and Venezuela.

Among the American Chemical Paint Company officials who addressed the delegates were: Leon Cherksey, chairman of the board; Gerald C. Romig, president; John O. J. Shellenberger, vice president and director of marketing; F. P. Spruance, Jr., vice president and general sales manager of the Metalworking Division; Alfred Douty, director of research; and R. H. Beatty, director of agricultural research.

NEW YOUNGSTOWN SHEET AND TUBE MILL OPERATING

The Youngstown Sheet and Tube Company has begun the scheduled operation of its new seamless tube mill at the Indiana Harbor Works, East Chicago, Ind., according to Harold Hoekelman, Chicago district manager.

PRODUCTION MACHINERY MOVES

Production Machinery Corp., designers and builders of metal processing equipment such as cut-to-length lines, slitting lines, pickle lines, uncoilers, and shears, has moved its engineering and sales offices to larger quarters at Maple Street & Nickel Plate R.R., Mentor, Ohio.

STANDARD PRESSED STEEL ACQUIRES NUTT-SHEL CO.

The Nutt-Shel Co., Glendale, Calif., has been acquired by Standard Pressed Steel Co., the Jenkintown, Pa., manufacturer of precision industrial and aircraft fasteners and steel shop equipment.

Acquisition was made through the exchange of 28,574 shares of SPS stock for all the capital stock of Nutt-Shel, a leading producer of special lightweight locknuts used in missiles, electronic apparatus, aircraft fuel tanks and related products.

The Nutt-Shel line of fixed and floating anchor nuts, dome nuts, gang channel and bolt retainers complements the SPS line of standard hexagon locknuts.

All New... from Binks

17½ lb. material handling pump supplies up to 4 spray guns

Binks new "Pogo" bung-type air-operated material handling pump is a "lightweight" in pounds only. In all other respects it is a rugged, dependable performer. It cuts your material handling costs by letting you send paints and coatings direct from original shipping drum to your spray guns. The pump has plenty of power to supply up to four spray guns . . . either directly or through a paint circulating system.

Fits 2" bung hole. No longer need a 2" opening be a production bottle-neck. Binks "Pogo" pump puts the contents of a 55-gallon drum at your disposal. Delivers at the rate of one gallon per minute — enough to operate four spray guns simultaneously! At no time is the drum itself under pressure.

Operates from open drums. Attach an auxiliary clamp and the Binks "Pogo" pump is ready for use on the rim of an open drum. Where you must keep your materials constantly mixed, an agitator may be mounted with the pump on a portable drum cover. A wide variety of pump and agitator mounting combinations is available.

Economical to operate — maintain. Long, double action pump strokes insure steady delivery and they make maximum use of operating air. Rugged construction insures perfect, long-life alignment of moving parts — reduces wear. The pump needs no lubrication. Spaced design separates motor from pump — positively prevents fluids from entering critical air motor parts.

For complete information ask your Binks industrial distributor for a copy of Binks Bulletin 707. Or if you prefer, write direct to the address below.

Ask about our spray painting school

Open to all...NO TUITION...covers all phases.

7714

Binks

EVERYTHING FOR SPRAY PAINTING

SPRAY GUNS

AIR COMPRESSORS

NATIONWIDE SERVICE

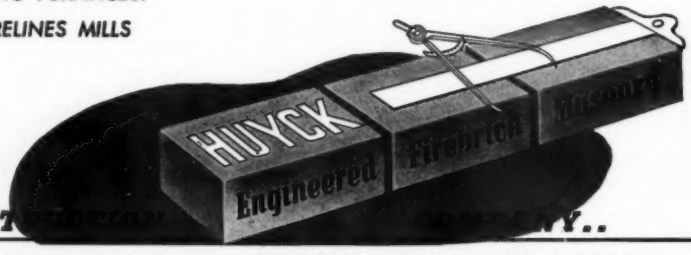
Binks Manufacturing Company

3122-40 Carroll Ave., Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U. S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

HUYCK *FURNISHES FIREBRICK MASONRY TO BUILD, REBUILD AND REPAIR ALL TYPES OF: ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.*

HUYCK *LINES AND RELINES MILLS*



HUYCK *MASONRY IS GUARANTEED TO GIVE YOU BETTER PERFORMANCE AND LONGER LIFE*

Huyck CONST...

1861 DeCook Avenue • Park Ridge, Illinois • TAlcott 3-0612

DeVILBISS COMPANY PURCHASES NEWCOMB-DETROIT COMPANY

The DeVilbiss Company has announced an agreement to purchase the Newcomb-Detroit Company, a pioneer in the design, manufacture and installation of custom-built, industrial finishing equipment.

Describing the acquisition as a move which will strengthen both companies, Howard P. DeVilbiss, president of the local company, said Newcomb-Detroit will remain a corporate entity and be operated as a subsidiary of DeVilbiss.

NEW U.S.-MEXICAN PAINT FIRM LAUNCHED

The newest international affiliate of W. P. Fuller & Co. was opened recently in Ensenada, Baja California. Participating were top officials from one of the West's oldest and largest paint and glass firms, and business and government leaders of Mexico.

W. P. Fuller & Co. de Mexico, S.A., which will manufacture and distribute Fuller paints and allied products throughout Baja California, is a joint venture, involving both Mexican and U.S. interests.

Wulfrano Ruiz, president-treasurer of the new company, welcomed over 500 guests to the official opening of the factory. Braulio Maldonado Sandez, governor of Baja California, delivered the opening address. W. P. Fuller Brawner, president of W. P. Fuller & Co. of San Francisco, also spoke to the group.

NEW LITHIUM-ALUMINUM ALLOY

A new lithium alloy developed by Alcoa Research Laboratories, New Kensington, Pa., is said to maintain high strength up to 400°F. This means that the thermal barrier, which has heretofore threatened aluminum applications in supersonic aircraft, has been pushed ahead by more than 100°F.

Alcoa's extensive research with lithium developed the fact that the rare-earth element not only serves to maintain aluminum's strength at high temperatures, but also produces the remarkable effect of increasing the modulus of elasticity of aluminum alloys.

GIBSON ELECTRIC MOVED

Gibson Electric Company, producer of electrical contacts, recently announced it has moved its manufacturing facilities and offices from Pittsburgh to a new plant in Delmont, Pa.

Herbert C. Graves, Jr., president, stated that construction of a modern 26,000-square-foot building has been completed on Old William Penn Highway. All of Gibson's manufacturing, research, purchasing, marketing, sales, and office facilities, formerly located at 8350 Frankstown Avenue, Pittsburgh 21, Pa., are housed in the new building.

PARKER-KALON ACQUIRES U.S. RIGHTS ON PNEUMA-SERVE

Louis Goldburg (center), who heads the Parker-Kalon Division of General American Transportation Corporation, and Spencer D. Moseley (left), assistant to the president and a director of General American Transportation, are shown here with George A. Tinnerman, president of Geo. A. Tinnerman Corporation, from whom Parker-Kalon has just acquired exclusive American manufacturing and sales rights to patented Pneuma-Serve fastener feeding equipment.

THE **fahralloy** TRADEMARK
is your guarantee of highest quality
BURNING TOOLS
25 years of service to the Porcelain Enameling Industry
•
the fahralloy co.
150TH AND LEXINGTON AVENUE • HARVEY ILLINOIS
A Member of the Alloy Casting Institute

What's its notice-power?

Color and gloss of the finish are just as important as styling and horsepower. And it's TITANOX* white pigments that help put notice-power in your automotive finishes. TITANOX-RA-50 and TITANOX-RA-NC are the rutile titanium dioxide pigments that provide the essential properties of ease of dispersion, uniformity of whitening, brightening and hiding power, clarity of tints and high resistance to fading-chalking. TITANOX is the number one choice in titanium dioxide, not only for automotive but all other types of industrial product finishes, including titania porcelain enamels. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices in principal cities.

TITANIUM PIGMENT CORPORATION

Subsidiary of **NATIONAL LEAD COMPANY**

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation. 5308-C

PEI

→ *from Page 45*

"the advisers" on what the men should manufacture.

In referring to color, she said that the new "daring" homes will use color, but that white will remain the mass choice for major appliances, as it typifies spotless cleanliness for basic equipment.

Mrs. Cartwright is enthusiastic about the possibilities of porcelain on aluminum which she says offers a complete new market in light kitchenware and other similar products. She visualizes its use for refrigerator accessories, inner doors, etc. In these products she said color will play an important part.

The industry isn't ready

Winding up the general session was William B. Tabler, architect for the Hilton Hotels Corporation. Tabler is one of the leading exponents of modern hotel design and has made extensive use of porcelain enamel in many of his structures.

Tabler stated that in the long run building materials must compete with masonry. He voiced the opinion that the industry was not yet geared for complete mass production of porcelain enameled building components. He voiced the opinion also that industry is not ready for an exterior wall for the tremendous requirements for hotels (the equivalent in capacity of 44 Queen Mary steamships will be "floated" by Pan American Airways in jet planes — this will completely change the hotel requirements for cities in all countries that are equipped for jet facilities).

Tabler stated that one reason he went to porcelain enamel was the failure of glass under thermal shock conditions. He said that formica with a foil backing led to the visualization of the use of porcelain enamel or "glass on steel". Now, he said, there is glass with a metallic paint on the back to take thermal shock. Using color slides, architect Tabler demonstrated the fabulous possibilities of curtain wall and semi-curtain wall construction. Examples of his work were shown in the Statler Hotel in Hartford ("first true window wall construction"), the Dallas Statler, and a number of Statler Hotels of fascinating designs in other countries.

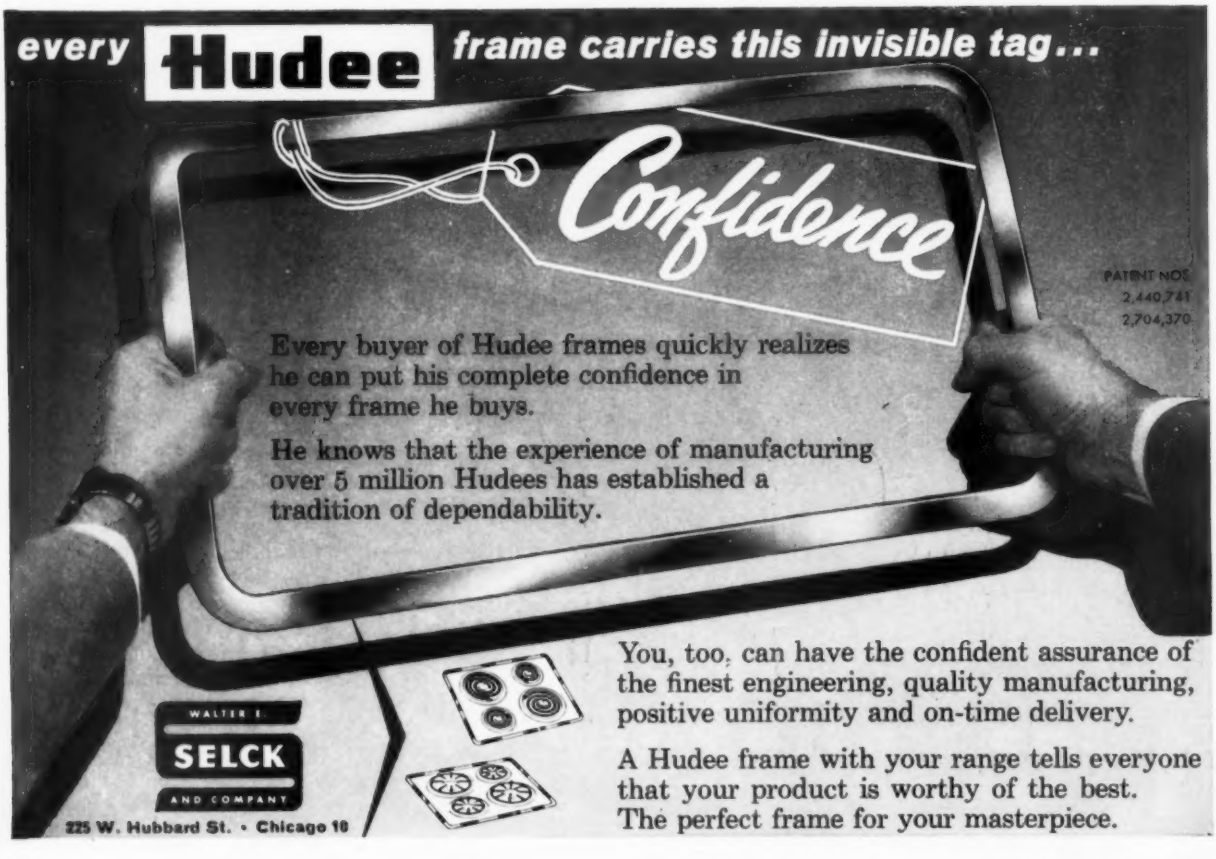
Porcelain enamel on steel has three basic problems, he said. One, the edges of the panels must be protected. Two, distortion. (Panels must be flat or textures and patterns developed to kill distortion). Three, the sound problem ("tinniness"). (Refrigerators and cabinets have solved it, he said; steel bathtubs have not solved it).

Tabler voiced the opinion that he could sell steel bathtubs on practically every job, if it weren't for the sound problem.

The architect's final advice to the enamelers was, "Use porcelain *like porcelain* — don't imitate".

PORCELAIN ENAMELS AND THE FUTURE

The Midwest Enamelers Club will begin its 1957-58 series of meetings on December 7 at the LaSalle Hotel in Chicago, with L. S. (Pat) O'Bannon as featured speaker. O'Bannon, of Battelle Memorial Institute, will speak on "Porcelain Enamels and the Future." The luncheon meeting will begin at 12:30 PM. Valuable door prizes and entertainment will also be offered.


every Hudee frame carries this invisible tag...
Confidence
PATENT NOS. 2,440,741 2,704,370
Every buyer of Hudee frames quickly realizes he can put his complete confidence in every frame he buys.
He knows that the experience of manufacturing over 5 million Hudees has established a tradition of dependability.
You, too, can have the confident assurance of the finest engineering, quality manufacturing, positive uniformity and on-time delivery.
A Hudee frame with your range tells everyone that your product is worthy of the best. The perfect frame for your masterpiece.
WALTER E. SELCK AND COMPANY
225 W. Hubbard St. • Chicago 10

Supplier Personals

→ *from Page 71*

new directors. They are *M. M. Anderson*, Alcoa vice president in charge of personnel and industrial relations; *Ralph V. Davies*, vice president and general sales manager; and *George W. Wyckoff*, vice president of T. Mellon & Sons, Pittsburgh.

Theodore S. Gulyas has been appointed new general sales manager of Triplex Screw Co., Division of The Murray Corp. of America. The new general sales manager has had many years of experience in the Fastener Industry in various phases of sales, sales analysis, marketing, merchandising, and advertising. He was affiliated with Lamson & Sessions Co. for seven years prior to his appointment at Triplex.

Born in Cleveland, Mr. Gulyas resides in Middleburgh Heights, Ohio, and is the father of four children. He is a graduate of Western Reserve University with B.A. and M.A. degrees.

John G. Farabaugh has been appointed to the newly-created post of director of industrial relations for Wheelabrator Corp., Mishawaka, Ind. Farabaugh is a member of the National Management Association.

GULYAS

FARABAUGH

The appointment of a new manager at the Baltimore Works of Armco Steel Corp. was announced by Clyde G. Davies, vice president in charge of operations of the company's Arco Division.

Chalmers C. McElvain will succeed G. D. Moomaw, who is retiring from active service after 45 years in the steel business. Both McElvain's appointment and Moomaw's retirement were effective Oct. 1, Davies said.

William R. Harkness has been promoted to sales manager of the Seaboard Pacific Division of Associated Spring Corp., Gardena, Calif., according to an announcement by Charles M. Holnback, general manager of the division.

Harkness, a native of Cleveland, Ohio, and a graduate of Cleveland College in 1942, was for five years with the Cleveland Trust Co. before coming West in May, 1955, to become internal auditor of the Century Metalcraft Co., in Los Angeles. He joined Seaboard as a salesman in October, 1955, advancing to sales supervisor in June, 1956.

Gail A. Smith, of Wyandotte Chemicals, J. B. Ford Division became Minneapolis District sales manager effective October 1st. This announcement was made by Ford Ballantyne, Jr., a Wyandotte Chemicals vice president, and general manager of the J. B. Ford Division.

Smith has spent 7 years in industry, and has recently done field research and "trouble-shooting," for Wyandotte Chemicals, J. B. Ford Division in most sections of North America.

Mr. Smith has both a practical and academic chemical background.

HARKNESS

SMITH

For dependable, easy, free movement, equip your appliances with free swiveling, sturdy Nagel-Chase Casters, the standard with the leading appliance manufacturers.

Refer any problem of mobility to Nagel-Chase, specialists in production casters.

Write for catalog today!

The NAGEL-CHASE MANUFACTURING CO.

2817 North Ashland Avenue, Chicago 13, Ill.

Manufacturers of Nagel-Chase Casters and V-Belt Pulleys

This is the house that BETTER CLEANERS BUILT!

Twenty-five years ago Northwest Chemical Company was founded with the express idea of supplying BETTER cleaners to the trade. Today, thanks to a steadfast adherence to the policy of top quality ingredients carefully blended with mature experience and pleasingly flavored with good service, Northwest has attained a position of respected leadership in the cleaner field.

A cleaner is only as good as the house behind it. Today's fast changing materials and methods quickly obsolete yesterday's products and create a need for completely new types of cleaners.

Northwest's continuing research program offers our customers the BEST advanced thinking, no matter what the problem. You are paying for Northwest's plus values wherever you buy. Why not avail yourself of them?

OUR 25th YEAR

Northwest products are manufactured on the west coast by—
ALERT SUPPLY COMPANY • Los Angeles

LO HI pH

NORTHWEST CHEMICAL CO.

9310 ROSELAWN DETROIT 4, MICH.

pioneers in pH cleaning control *serving you since '32*

When it's

USS VITRENAMEL...

it's fine enameling sheet!

Quality is the watchword for USS VITRENAMEL steel enameling sheet. This outstanding quality is achieved by special care at every production step. From open hearth to the last operation, nothing is left to chance.

The striving for fine quality in USS VITRENAMEL does not stop here. Constant development and research goes on to make VITRENAMEL still better, more practical, more economical for you, the manufacturer of appliances, architectural panels and other enameling applications.

USS VITRENAMEL will be available in coils as well as cut lengths. Just phone our nearest district sales office.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS VITRENAMEL

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UNITED STATES STEEL

USS

ROSS
Air Systems

Engineered Atmospheres for Better Processing

A ROSS METAL DECORATING PROJECT
View shows an example of ROSS SERVICE in the field of metal decorating. This Ross Oven is being used for baking, curing, cooling or converting of decorative coatings, enamels, inks and varnishes on lithographed metal sheets.

How Ross Serves in the Fields of:
BAKING • CURING • COOLING • CONDITIONING
DRYING • PAINT FINISHING • VENTILATING

In these operations, we are dealing with many variables. We are dealing with such factors as air, circulation, impact, temperature, moisture, solvent vapors, surface contact, penetration, absorption, zoning that go to make up a processing 'atmosphere'. It's more than air conditioning. It's creating a favorable working atmosphere.

Our first step is to study the problem with the cooperation of the customer's personnel; next to design the system and integrate all the necessary units to produce the desired results; then to manufacture and install. The desired end-product is the target. We design and manufacture to hit this target at the lowest possible overall unit cost.

Literally thousands of Ross units and systems of different types have been installed to provide Engineered Atmospheres in such industries as pulp, and paper, metal working, textile ceramics, foundries, pharmaceuticals, food processing, plastic processing and converting. The consistently successful operations with these many systems and units can be traced directly back to skill in design and durability of construction.

When you call on Ross Engineers to discuss a problem confronting your engineering and production personnel, you will in effect be calling upon more than thirty five years of experience in the design and installation of systems and units to provide the best 'working atmosphere' for producing the desired end-product in operations such as those listed in the heading.

THE ROSS GROUP
OF COMPLEMENTING SERVICES

J. O. Ross Engineering Corporation, New York
Andrews and Goodrich Division, Boston
Ross Engineering of Canada Limited, Montreal
Ross Midwest Fulton Corporation, Dayton
Carrier-Ross Engineering Company, Ltd., England
John Waldron Corporation, New Brunswick, N. J.

J. O. ROSS ENGINEERING CORP.

Main Office: 444 Madison Avenue, New York 22, N. Y.

ATLANTA BOSTON CHICAGO DETROIT LOS ANGELES SEATTLE

glasslined water heaters

→ *from Page 59*

the furnace chain. A careful inspection of each component is conducted during this transfer.

Beyond this transfer point, the 490 foot conveyor enters the furnace at a speed of four feet per minute. Conveyor hangers are spaced at two-foot intervals. As a rule, the tanks are hung on alternate hangers, but when production requires it, tanks can be hung on every hanger, thus stepping firing speed up to 120 tanks an hour. The furnace has a 30 foot pre-heat zone, a 35 foot firing zone, and a 30 foot cooling zone. It is gas-fired, with oil standby.

Another inspection occurs when the tanks and flue and bottom assemblies are unloaded from the furnace conveyor. The tank shells are tapped prior to installation of the bottoms to assure that no chips will be enclosed. A semi-solid cutting lubricant is used for tapping to prevent cutting oils from entering and soiling the tank interior.

Welding after enameling

The next step is to press the bottom and flue assembly into the tank body and weld it in place. After initial spraying, the slip application is wiped away in a strip ½ inch wide around the bottom rim to provide bare metal for welding. This rim is about 1-inch wide, and the remainder of its surface is glass coated. The bottom is designed for a "tight fit" into the tank body, and when it is pressed in place, slight elongation of the tank body metal occurs. However, this is not sufficient to affect the glass lining. After the bottom is in place, it is welded on a circumferential welder. Fusion is accomplished completely through the tank metal, and through 75 per cent of the thickness of the rim metal. The heat of welding causes the glass lining on the bottom rim to fuse with the glass lining in the tank body, thus forming a continuous glass lining over the joint between body and bottom.

After the bottoms have been pressed in and welded in place, all weld seams are given a test, using a soap solution and 60 psi of air pressure in the tank. The nipples and anode are then installed and the heater tank is ready for its insulation and jacket.

The jackets are produced in a conventional manner by shearing sheet metal to size, rolling it, crimping the side seam, then cleaning prior to painting. Painting is accomplished in an automatic electrostatic paint booth, and the enamel is baked at 400° F.

New insulation technique

A new technique that eliminates the use of the conventional clamshell shroud is used for applying the insulation and jacket over the tank body.

The glass fibre insulating material is purchased in paper-backed rolls of pre-cut and pre-marked insulation blankets, each blanket just the right size for a heater. A specially designed table is used for unrolling the blankets. The paper backing is attached to a micro-switch operated roll at one end. The blanket roll remains at the other end. The blanket sections are packed side by side in the original roll.

When blankets are needed, the roll that takes up the backing paper is started. When enough backing paper has been pulled from the original blanket roll to expose two blankets on the table top, a limiting microswitch stops the take-up roll. The two exposed side by side insulation blankets have a pre-applied marking directly in the center.

Each insulation blanket is approximately twice as long as the tank it will cover, and its width corresponds to the semi-periphery of the tank. The blanket is folded down over the tank with its center marking at the top of the tank. A tapered, glass fibre collar is then attached to the lower end of the heater jacket. This collar acts to "funnel" the insulation around the heater body as the jacket is slipped downward into place. With the jacket in place, the collar is unhooked and removed. The fold of insulation over the top of the tank is then pierced for the nipples and flue opening. The remainder of the fold is left in place over the top of the tank and serves to hold the body insulation in place during subsequent handling. Prior to the use of this supporting fold, the insulation blanket would sometimes slide downward inside the jacket, leaving a portion of the upper tank without insulation. Mission Appliance engineers claim that this new technique for applying the insulating blankets is much faster than the older clamshell method, as well as providing a blanket that won't slip downward after it has been placed.

One man can package a heater in thirty seconds

A technique for packaging water heater units has been developed by engineers at Mission Appliance Corporation, working in conjunction with engineers from a major container supply company. Corrugated containers are used. A single employee can carton and seal a water heater in 30 seconds, with no help, and while working at a pace he can maintain throughout an eight-hour shift.

The packaging machine itself (actually a built-up, factory engineered assembly) consists of a combination of conveyors, folding bars or guides, folding rollers, and glue applicators. The water heater approaches the packaging station on a roller conveyor and already mounted on a base section provided with leg cups which will reinforce the container bottom. The operator stands on an elevated platform ready to unfold and slip the carton down over the heater when it arrives opposite his position.

When the heater arrives on the first platform of the packaging machine, the operator touches a foot lever which causes two cam-actuated sections of the roller conveyor to open outward away from the heater bottom and provide room for the crosswise tube flaps as the container slips downward into place. The flaps horizontal to conveyor travel are folded backward and up by folding bars. With the container in place over the heater, the operator touches another foot lever to close the two conveyor sections which fold the crosswise bottom flaps into place as they close. A slight shove by the operator then moves the heater forward onto a narrow conveyor belt which leaves room on each side for folding the horizontal flaps into place.

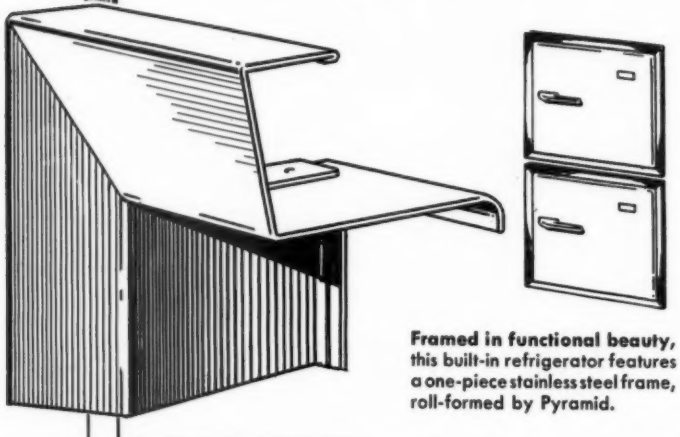
Inclined folding bars then guide the horizontal flaps downward against glue rollers, then fold them inward against the container bottom. At this point the packaged heater moves onto a short section of triple conveyor belt, with the two outside belts pressing the horizontal flaps firmly into place while the glue dries. Travel on this triple belted conveyor section is for about 30 seconds — time enough for the glue to set. The cartoned heater then moves onto a roller conveyor which leads to the shipping department.

The only manual operations required in packaging are slipping the carton tube into place, and actuating the foot levers which fold the two crosswise flaps into place. This packaging machine has been in operation for some time at this writing, providing consistently good and trouble-free results. A single operator packages all the heaters as they arrive from the final assembly line.

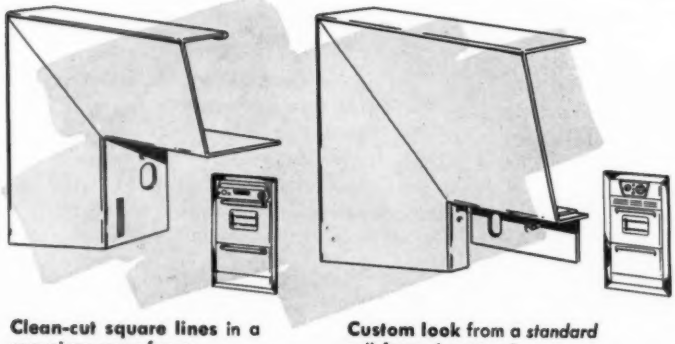
"SQUARE OFF" FOR SALES!

with PYRAMID MOULDINGS

You, too, can achieve the much-wanted "square look" in free-standing or built-in appliances—*with little or no tool cost!* Pyramid offers *standard designs* roll-formed from stainless steel . . . or *custom designs* created at surprisingly low cost, thanks to the economies inherent in the roll-forming process. Whether your need is for square types, round or straightaway—when it comes to metal mouldings, come to Pyramid, specialists in roll-forming for 30 years!



Framed in functional beauty, this built-in refrigerator features a one-piece stainless steel frame, roll-formed by Pyramid.



Clean-cut square lines in a one-piece oven frame.

Custom look from a *standard* roll-formed pattern!

Write Today for Your Free "Plan Book of Metal Mouldings"

Pyramid Mouldings Inc.

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NEW YORK...CALIFORNIA

Safety in the design

→ *from Page 29*

three with the motor hood removed, represents a construction required by the Underwriters' Laboratories to avoid possible shock hazard. The brush holder and lead wire terminals are protected by insulating covers, and the headlight socket has no exposed current-carrying parts. Consequently, a user can not normally touch a bare electric conductor, even with the motor hood removed. The insulating covers would not have been required had it not been for the headlight. The motor hood provides all the insulation and protection normally required as long as it is in place. However, since the hood must be removed to replace the headlight, the insulating covers are required.

Even though the insulation is sufficiently temperature resistant, possesses good aging characteristics, and is capable of withstanding the usual proof voltage tests, an appliance may still not be free of shock hazard. The leakage current that can flow between the windings of an appliance and earth through the insulation, because of the capacitive coupling, must be limited to a safe value under all conditions in which the appliance is expected to be used. Although it is obvious that a portable appliance should be so designed that a user will never be subjected to an electric hazard when touching any part of the appliance and earth, there has been no agreement as to how to achieve this. Nor has there been agreement on how to recognize whether it has been achieved.

Earthing the exposed metal parts to eliminate shock hazard due to leakage current is common practice for portable power tools. Earthing in this manner is required for portable appliances in several foreign countries. However, there is no way of compelling a user to complete the circuit to earth. Three-conductor cord and special three-prong plugs and outlets fail to assure that the connection to earth will always be made. So, rather than depend on a connection to earth for freedom from shock hazard, the better choice may be to provide adequate insulation.

Any electric current that can be felt should be considered hazardous. Even though the current may in itself be harmless, it can cause the user to recoil and thus precipitate a serious accident. In 1932, the Association of Edison Illuminating Companies in the publication "Fundamental Safety Requirements for Electrical Equipment to be Used by the

to Page 85 →

ROPER . . . another user of PERMA-VIEW WINDOWS

ROUND

RECTANGULAR

SQUARE

TRAPEZOID

We can manufacture any shape, any size, any thickness to meet your engineering requirements. Alternate methods of attachment may be used.

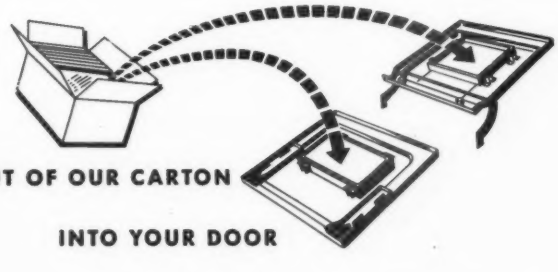
GEO. D. ROPER CORPORATION

—one of the

61 leading range manufacturers

using

PERMA-VIEW oven-door windows



OUT OF OUR CARTON

INTO YOUR DOOR

PERMA-VIEW helps sell more new ranges. Home makers have come to expect "visible cooking" when they buy a new range. PERMA-VIEW "the window you can see through always," is the logical answer to this demand.

The strong, steel-encased, double-pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging."

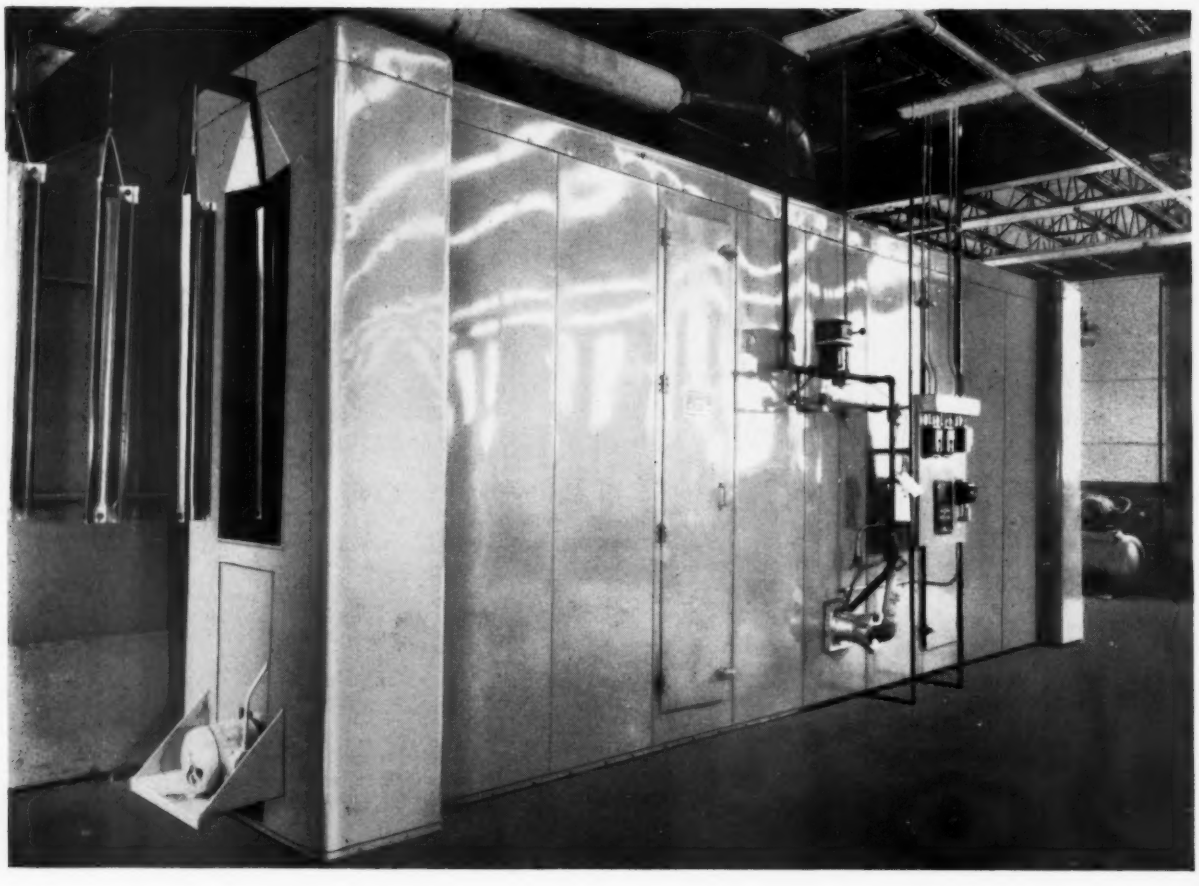
The PERMA-VIEW window is pre-engineered and comes to you ready for immediate installation in your range. Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on the ease and economy of adding this sales feature to your new ranges.

GENUINE PERMA-VIEW NON-FOG

MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

INTEGRATION



Perhaps you'll agree that one of the most important phases of manufacturing is to blend your production facilities into a smooth-running operation.

This is specially essential in your finishing system. It takes a complete understanding of your product—and the steps to produce the quality of finish required—to successfully integrate finishing ovens, conveyors, washing machines, spray booths, etc. The end result is a profitable, quality product—with a minimum operational cost.

ALWAYS CONSIDER THESE SIX QUESTIONS

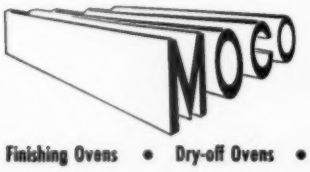
- Does the finishing system have capacity for increased production?
- Is the equipment simple enough to allow easy maintenance?
- What type of materials handling is best suited for your process and production?
- Are floor space requirements at a minimum?
- Has the system been engineered for lowest operational cost?
- Does safety equipment provide sufficient protection for your plant and personnel?

MOCO has long given careful consideration to all of these factors—and countless others. Engineering to your specific product requirements is always "the starting point."

When you are considering the purchase of a finishing system—why not consult with a qualified MOCO engineer and learn more about MOCO *Integrated* Finishing Systems.

Here's Valuable Information

This interesting bulletin on MOCO systems is yours for the asking. Why not write today?



FINISHING DIVISION

MICHIGAN OVEN COMPANY

411 BRAINARD, DETROIT 1, MICHIGAN

Finishing Ovens • Dry-off Ovens • Washing Machines • Dip Tanks • Spray Booths • Bonderizing Units • Flo-coaters • Conveyors

Safety in the design

→ *from Page 82*

Public", established 0.2 milliampere, 60 cycles, r.m.s. as the maximum permissible leakage current. Various investigations conducted since then have confirmed that 0.2 milliampere is below the threshold of perception of most persons.

Any portable appliance can be designed and built so as to limit leakage current to a safe level, even under conditions of high relative humidity. However, it requires careful attention to such details as surface characteristics of insulation, creepage distances, placement of parts, and other factors. It is likely to add to the cost of the appliance.

The floor polisher shown in figure four was designed both to polish and to wet scrub floors. During wet scrubbing, water of the detergent solution will be splashed on, and into, the polisher. Such usage normally invites electric shock hazard, but the floor polisher shown here is a design engineered especially to prevent it.

All metal parts of the floor polisher which can be touched by the user while operating it in the normal manner are insulated from the main frame. The plastic hood, which is shown to the rear of the floor polisher, fits in a recess in the vinyl furniture guard. The only openings in the hood are those required for the handle bail and handle control lever. The bail and handle control lever, which are the only exposed metal parts when the floor polisher is in the operating position, are insulated from the main body by insulating bushings, washers, and a link.

When the floor polisher is turned upside down, it is possible for a user to touch the metal frame. With the electric power on and the polisher wet, touching the frame might expose the user to excessive leakage current. But a user is likely to come into contact with the frame only when removing the polishing or scrubbing brushes, and this can be done only when the power is switched off. A double pole switch is used on the floor polisher so that both sides of the electric power supply will be deenergized when the switch is off. This arrangement assures complete freedom from shock hazard when the polisher is handled in changing the brushes.

The appliances illustrated were selected because each includes features specified by the design engineer to enhance safety. In each case the design engineer used his judgment in developing a product that is safe to use.

METAL PRODUCTS STATISTICS

a current report on available production, shipment and sales figures for important products in the appliance and fabricated metal products manufacturing field

GAS WATER HEATERS — August shipments 206,800, 15.1 per cent below '56; January-August inclusive 1,731,500, 12.5 per cent below '56.

GAS RANGES, BUILT-IN — August shipments 16,300, 7.9 per cent over '56; January-August inclusive 121,900, 16.9 per cent over '56.

GAS RANGES, FREE STANDING — August shipments 166,700, 11.2 per cent below '56; January-August inclusive 1,169,400, 13.1 per cent below '56.

GAS FURNACES — August shipments 74,500, 25.3 per cent below '56; January-August inclusive 439,400, 16.4 per cent below '56.

GAS FIRED BOILERS — August shipments 12,900, 16.2 per cent over '56; January-August inclusive 53,900, 8.1 per cent over '56.

GAS CONVERSION BURNERS — August shipments 23,400, 19.6 per cent below '56; January-August inclusive 88,200, 21.3 per cent below '56.

ELECTRIC REFRIGERATORS — August shipments 240,500, 21.8 per cent below '56; January-August inclusive 2,362,300, 13.9 per cent below '56.

ELECTRIC FREEZERS — August shipments 86,000, 8.4 per cent below '56; January-August inclusive 666,300, 7.1 per cent below '56.

ELECTRIC RANGES, BUILT-IN — August shipments 27,300, 0.4 per cent over '56; January-August inclusive 273,500, 6.5 per cent over '56.

ELECTRIC RANGES, FREE STANDING — August shipments 58,500, 16.8 per cent below '56; January-August inclusive 615,700, 27.2 per cent below '56.

ELECTRIC WATER HEATERS — August shipments 60,500, 11.4 per cent below '56; January-August inclusive 517,200, 16.3 per cent below '56.

ELECTRIC DISHWASHERS — August shipments 36,700, 80 per cent over '56; January-August 255,400, 8.8 per cent below '56.

ELECTRIC FOOD WASTE DISPOSERS — August shipments 47,300, 20 per cent over '56; January-August 343,600, 16 per cent below '56.

COMBINATION WASHER-DRYER — August factory sales 11,840, 18 per cent over '56; January-August inclusive 112,808, 91 per cent over '56.

WASHERS, AUTOMATIC & SEMI-AUTOMATIC — August factory sales 246,728, 8 per cent below '56; January-August inclusive 1,790,038, 15 per cent below '56.

WASHERS, WRINGER & ALL OTHER — August factory sales 82,318, 13 per cent below '56; January-August inclusive 578,405, 25 per cent below '56.

*ELECTRIC DRYERS** — August factory sales 77,304; January-August inclusive 451,352.

*GAS DRYERS** — August factory sales 39,297; January-August inclusive 199,271.

IRONERS — August factory sales 3,475, 28 per cent below '56; January-August inclusive 26,292, 26 per cent below '56.

VACUUM CLEANERS — August factory sales 241,218, 12.9 per cent below '56; January-August inclusive 2,070,024, 15.5 per cent below '56.

METAL FURNITURE — August shipments were 7 per cent over '56; January-August inclusive was 5 per cent below '56.

TELEVISION — July shipments 465,285, 3.3 per cent below '56; January-July inclusive 2,969,251, 7.9 per cent below '56.

RADIO (Including Automobile Receivers) — July shipments 581,808, 9.4 per cent below '56; January-July inclusive 4,018,236, 2.7 per cent over '56.

COMPRESSOR BODIES (Including Automobile Units) — Shipments for June 343,769, 24.7 per cent below '56; January-June inclusive 2,710,680, 3 per cent below '56.

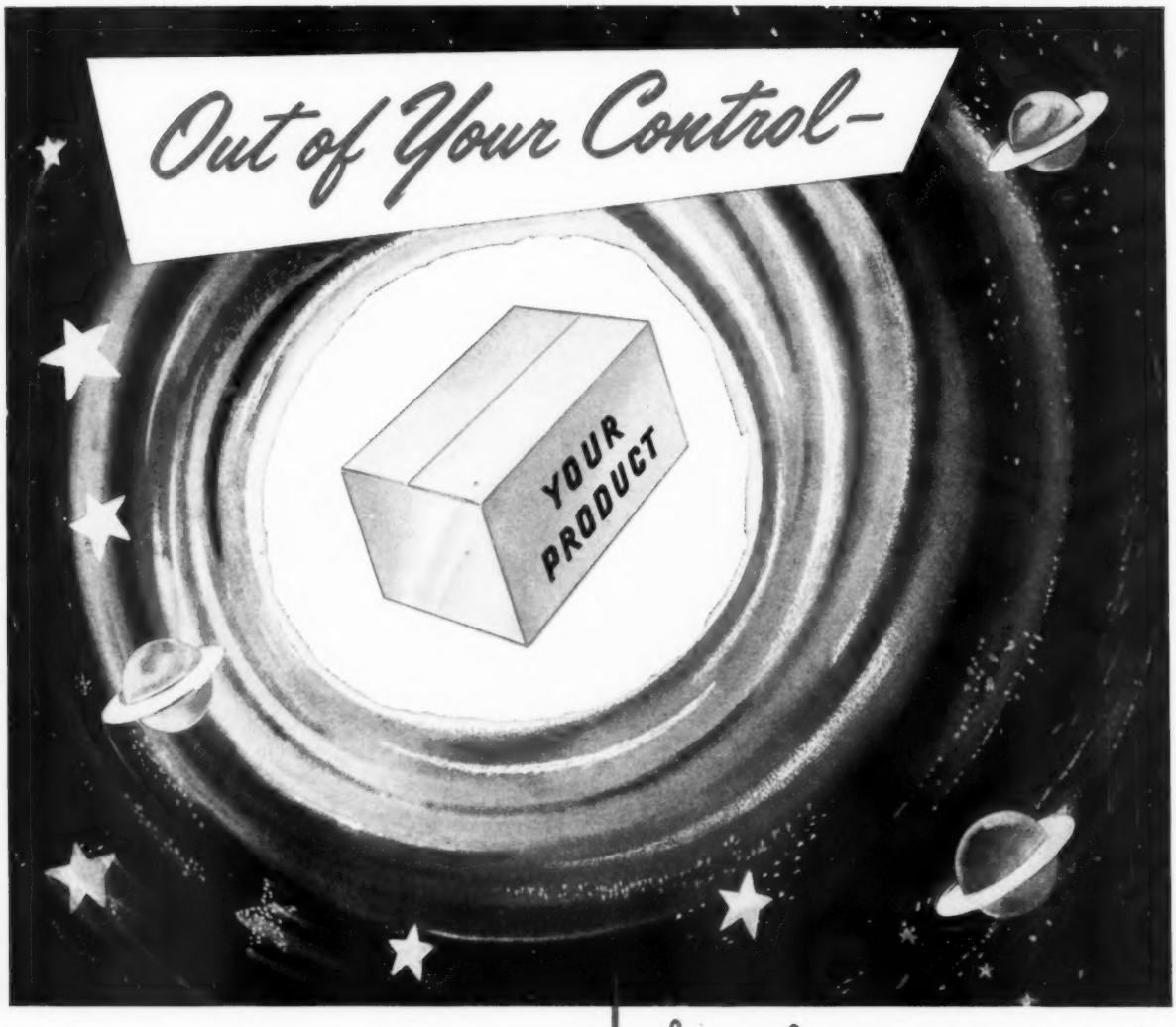
STEEL SHIPPING BARRELS & DRUMS — July shipments 2,979,000, 13 per cent below '56; January-July inclusive 21,089,947, 10.1 per cent below '56.

STEEL PAILS — July shipments 7,136,000, 6 per cent below '56; January-July inclusive 45,393,993, 7.7 per cent below '56.

TYPEWRITERS — July factory shipments 124,625; January-July inclusive 928,258.

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

*Note: The above 1956 data have been adjusted to reflect combination washer-dryer sales separately. Combination sales are not counted as either an automatic washer or an automatic dryer. For 1956, breakdown of gas and electric dryer data from which gas and electric combination data have been subtracted, cannot be released without disclosing individual company information.



. . . but **SAFE** in an *Inland* container!

● As your product goes out the shipping room door, you lose all direct control over its condition. The shipping container becomes its sole defender against the many hazards it must endure until it reaches its destination. An Inland container, carefully engineered and made of quality materials will deliver your product in the condition your customers expect to receive it. That's why we say "Inland Boxes Build Good Will."

If we're not already serving you, call or write today. An experienced Inland Package Engineer is always at your service.

INLAND CONTAINER CORPORATION

INDIANAPOLIS 6, INDIANA

Corrugated Fiber Boxes

MILLS: Macon, Georgia; Rome, Georgia.

PLANTS AND SALES OFFICES: Indianapolis, Indiana; Middletown, Ohio; Milwaukee, Wisconsin; Evansville, Indiana; Detroit, Michigan; Macon, Georgia; Erie, Pennsylvania; Ashtabula, Ohio; Orlando, Florida; Rome, Georgia; Biglerville, Pennsylvania; Dallas, Texas.

OTHER SALES OFFICES IN PRINCIPAL CITIES

safe transit

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DANA CHASE PUBLICATIONS
York Street at Park Avenue
Elmhurst, Illinois

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

Educational color-sound films tell the story of safe transit

TWO educational films which tell the Safe Transit story are now available. Both are 16 mm., in sound and color.

The NST films show the test procedures in full and explain the test shipments which led to their adoption. Available to manufacturers, testing laboratories, carriers, and other interested groups, the films have been valuable aids in disseminating nationwide information on the National Safe Transit Program.

The films also give to management, and those directly responsible for the safe transit of packaged products, a comprehensive picture of the standards and tests established for determining the "shipability" of *packaged products.*

Purpose of the films

NST Film #1, "The National Safe Transit Program," is 30 minutes in length. This film covers in detail Projects 1 and 1A—pre-shipment tests for packaged products weighing 100 pounds or over and for packaged products weighing under 100 pounds.

NST Film #2, "The National Safe Transit Story," is 17 minutes in length. This film treats these two projects in summary fashion and presents in detail Project 1B—procedure for pre-shipment testing of basic carloading—which, when combined with Projects 1 and 1A, offers an additional means for still greater reduction in transit damage.

Two years in the making

Each film was two years in the making, and test data was compiled by means of test shipments from the East Coast to the West Coast—from Florida to Canada—covering many thousands of miles. All modes of common carrier were used—Railroads, Express, Trucks, and Air.

On the scene locations of filming were as follows: New York, N. Y.; Buffalo, N. Y.; Detroit, Mich.; Springfield, Mass.; Mansfield, Ohio; the Pennsylvania Turnpike; the Canadian National Railroad Yards; and Chicago, Illinois.

Interest in films

Carriers—Carrier groups have shown considerable interest in the films and have arranged for many showings throughout the country.

Container Firm Laboratories—Container firm laboratories have used the film widely, and several firms have purchased copies for use in their educational and promotional programs.

Manufacturers—Interest has been good, and showings have been scheduled by both certified and non-participating companies. Several manufacturers have purchased copies of the films for use in their promotional and educational work.

Foreign—Members of the French Packaging Institute (a group which represents every important industry in France) visiting in this country under the auspices of the Mutual Security Agency found the film shown them to be extremely informative and helpful. The showing was arranged in New York by the Research Institute of America, Inc. Likewise, members of the Japanese Distribution Techniques Study Team, visiting the U. S. under the auspices of the International Cooperation Administration, displayed great interest in the film and expressed the desire to purchase copies for use in Japan. An NST film has also been shown in England.

Others—Many universities and professional fraternities and societies have used the films in classroom work and in meetings.

Films for loan or purchase

Films may be purchased or rented for educational, promotional and sales work by certified manufacturers, laboratories, and carriers. Purchase and loan requests should be directed to the Washington office of National Safe Transit, 1145 Nineteenth Street, N. W.

Purchase price is $100.00; rental fee is $10.00 to cover cost of outgoing postage, handling, checking and cleaning of the film upon its return. Date of proposed showing and two alternative dates should be specified.

NST ...icti

these photos show h...mbe... saved money and gain...tisfi...

ADMIRAL — "National Safe Transit pre-shipment testing has helped us reduce cost and damage on crating for ranges and refrigerators substantially in the past five years here at Midwest Mfg. Corp., subsidiary of Admiral." Andrew Burrise, director of quality control.

Below: NORGE — "These two pieces of equipment are used several days of each week. Design engineers who looked askance at this testing abuse a few years ago now request tests on each new design feature or change in existing design." G. Zorn, crating engineer.

Above: CLAROSTAT — "It is interesting to note that since the adoption of the National Safe Transit Program, our claim figure for 1956, in comparison to sales for the same year, has dropped to the low percentage of 1/200 of 1 per cent." V. Sillitta, traffic manager.

Below: BAY STATE ABRASIVE — "When shipping grinding wheels, our prime concern is safety. The use of National Safe Transit labels indicates to our customers that we are willing to go beyond our own packaging departments to insure safe shipment of our products." A. C. Stowe, work simplification and packaging engineer.

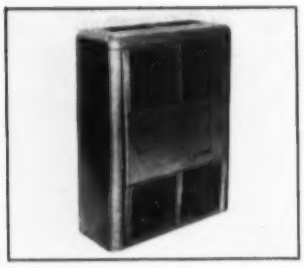
' iaction

' hamber companies have
gain tisfied customers

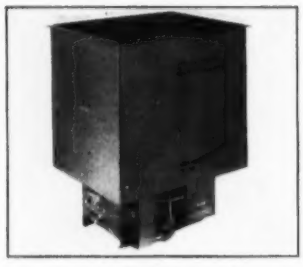
Right: UNITED STATES RUBBER — "I have found that National Safe Transit tests have been of inestimable value in settling questions not only in packaging and protection, but in matters concerning production and quality. A National Safe Transit test package of enameled steering wheels brought to light a previously-unknown production problem in drying enamel. The test resulted in giving a warning to our production department, and our developing a protective method to the package which allowed the department time to undertake corrective measures without curtailment of production." F. S. Smith, manager, materials handling division.

Above: INGERSOLL — "The concensus is that, from a sales standpoint, we have given our salesmen a real promotional tool in talking to a customer concerning reduced costs from damage through satisfactorily-designed and tested packaging." K. N. Stought, chief industrial engineer.

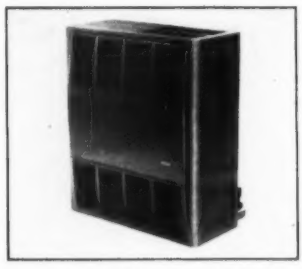
Left: AVCO — "Cabinets, sinks, dishwashers, ranges, ovens, and disposers reflect cost savings resulting from packaging and testing to meet National Safe Transit standards." K. O. Dupree, director of sales.



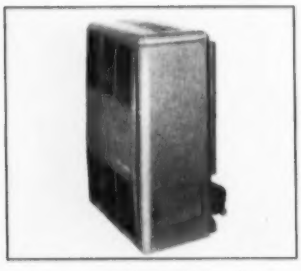
Safti-Vent gas furnace saves 70% on installation



Shallow gas floor furnace —space saver



Gas space heater for efficient heat



Oil circulating heater with Electro-Jet burner

"The H. C. Little Burner Company heaters are properly protected for safe shipment through the use of Watkins Containers."

The Finest Products Go In Watkins Containers

They are preferred because of:

1. Low Cost
2. Stacking Strength
3. 75% Assembled—Upon Receipt
4. Ease of Assembly
5. Easy Handling
6. Minimum Storage Space
7. Protection from Dust and Dirt

THESE COMPANIES BUILD WATKINS CONTAINERS

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ILLINOIS BOX & CRATE CO.
811 Center Street, Plainfield, Illinois

KIECKHEFER BOX & LUMBER CO.
1711 W. Canal St., Milwaukee 3, Wis.

LEWISBURG CONTAINER CO.

LOVE MFG., INC.
P.O. Box 546, Wichita, Kansas

UTILITY CRATE CORPORATION
2019 Imperial St., Los Angeles 21, Calif.

Custom Protection . . .

THE **WATKINS CONTAINER** MANUFACTURERS

THIRTEEN NEW NST COMPANY CERTIFICATIONS

Recent product manufacturers to be certified under the National Safe Transit Program are as follows: Vitreous Steel Products Company, Cleveland, Ohio (Shower cabinets); Cribben and Sexton Company, Independence, Kansas (James-Universal Automatic Dishwasher); The Rudolph Wurlitzer Company, North Tonawanda, New York (Talking machines and organs); M & D Store Fixtures, Inc., Cambridge City, Indiana (Store Display fixtures); Stromberg-Carlson Company, Rochester, New York (Electrical appliances); Henry Furnace Company, Medina, Ohio (Residential furnaces).

Stewart-Warner Corporation, Lebanon, Indiana (Heating and Air Conditioning Equipment); Burnham Corporation, Irvington, New York (Boilers, radiators and heating equipment); Ideal Dispenser Company, Columbus, Ohio (Bottle vendors); Fairlane, Inc., Atlanta, Georgia (Coffee Vending machines); Todd Company Division, Burroughs Corp., Rochester, New York (Checkwriting equipment); Texas Instruments, Inc., Houston, Texas (Recording instruments); Wilmot Castle Company, Rochester, New York (Hospital equipment).

LABORATORY CERTIFICATIONS

Recently certified Safe Transit Laboratories include: Ottawa River Paper Company, Flint, Michigan; The Continental Can Company, Syracuse, New York; Green Bay Box Company, Green Bay, Wisconsin; Gair Company Canada Limited, Toronto, Ontario; The Corrugated Container Company, Columbus, Ohio.

NEW NAVY SPECIFICATION

Interim Federal Specification PPP-P-0021 (Navy-S&A) was issued recently, and substantial savings for both government and industry are predicted. This performance type specification, covering, "Packaging and Packing of Porcelain Enamel Products and Major Household Appliances" is based upon the National Safe Transit Program's concept of pre-shipment testing.

The National Safe Transit Committee lists three important services of the new specification: (1) It will enable government agencies to take advantage of commercial packaging practices in their procurement of major appliances and other similar products. (2) Industry will be able to supply government contracts with products from regular packaging assembly lines, thus utilizing established commercial packaging techniques and standards rather than having to adopt special government requirements at added cost. (3) Companies will be provided with a minimum standard for fair, competitive bidding.

The new specification is the result of careful and thorough study by both government and industry representatives, revising an Interim Federal Specification issued in 1954. The National Safe Transit Committee served as Coordinator for this special cooperative project of government and industry, which represents the combined efforts.

Copies of the new specification may be obtained from the NST headquarters at 25 cents each.

TRAINING COURSE

Container Laboratories, Inc., Washington, D.C. is offering a five-day training course designed to teach aspects of government packaging. Known as the Management Aspects of Government Packaging, the course is being conducted every other week on a continuing basis.

CUSTOM-DESIGNED with
Bigelow-Garvey's
TIGHT CORNER
MODEL A
Pallet box is easily attached to any standard pallet. Collapsible for storage and return shipment.
MODEL C
Pallet box with drop-leaf panel for greater accessibility.
SHIPPED FROM 5 CONVENIENTLY LOCATED MILLS
34 YEARS PACKAGING EXPERIENCE
Pallet box for easy access to contents when stacked or in racks. With or without self-locking front panel.
Expendable pallet box. Inexpensive, permitting discard after usage. Top cover, if desired.
MODEL B
EXPENDABLE
Collapsible crate with exclusive B-G Tight-Corner Hinge. Unusually rigid and light in weight. Inexpensive.
B-G Tight Corner Hinged Crates engineered to your specific requirements.
STOVE
TIGHT CORNER CRATE
BATH TUB
TIGHT CORNER CRATE
For greater strength in stacking, materials handling and shipping, use Bigelow-Garvey Tight-Corner Collapsible Crates and Pallet Boxes...All containers pre-tested in our laboratory.
B-G invites your inquiries. Sales engineer will call upon request.
Tight Corner Hinge Crate
Wooden Pallets
Model A Pallet Boxes
Model B Pallet Boxes
Model C Pallet Boxes
Kraft Crate
Wooden Boxes
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Here's why Whirlpool uses International shipping containers

Special construction provides safe transit.

- Fast, easy packing assembly cuts down labor cost
- Dealers report refrigerators arrive factory-fresh in International's dust-proof containers
- Take less room—store better
- Tube and cap design enables lift truck to handle easily without pallets . . . provides grip for easier handling by the retailer
- Large clean surfaces allow product identification and advertising

If you have a problem in container design, write for full details of our custom design service.

Quick assembly speeds up packing operation.

Lift truck inserts the lifting flange under one side of cap, pulls up. Strong construction enables sure, fast lifting, close stacking without usual jostling.

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CONTAINER DIVISION
220 East 42nd Street, New York 17, N. Y

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ELECTRO DYNAMIC Division of General Dynamics Corporation, manufacturers of electric motors for industrial and marine use, safeguard their quality by shipping them in Chicago Mill's hinged corner plywood shipping containers. These containers provide maximum protection against shipping hazards, stack high, saving storage space, and are quickly assembled.

Large or Small — we make 'em all. A complete line of containers for every shipping purpose.

FREE!

Illustrated catalog describing the variety of CHICAGO MILL Containers!

PALLET BOXES— Wire Bound

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Wirebound Crates

Wirebound Boxes

Corrugated

Hinged Corner Crates or Boxes

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ADVERTISERS' INDEX

	PAGE
AMERICAN NICKELOID CO.	31
ARMCO STEEL CO.	1
BIGELOW-GARVEY LUMBER CO.	91
BINKS MFG. CO.	72 & 73
BURDETT MFG. CO.	36
CERAMIC COLOR & CHEMICAL MFG. CO.	2nd COVER
CHICAGO MILL & LUMBER CO.	93
CHICAGO VITREOUS CORP.	50
COLUMBIA-GENEVA STEEL DIV.	79
CONTROLS CORP. OF AMERICA	4th COVER
CUYAHOGA SPRING CO.	77
DANIELSON, V. W., MFG. CO.	66
DESPATCH OVEN CO.	61
DETROIT STAMPING CO.	14
DIVERSEY CORP., THE	60
DOW CHEMICAL CO.	2
EXALCO MFG. CO., THE	7
FAHRALLOY CO., THE	74
FASTEX DIV., ILLINOIS TOOL WORKS	28
FERRO CORP.	11 & 12
GLIDDEN CO., THE	25
O. HOMMEL CO., THE	46
HUYCK CONSTRUCTION CO.	74
INGRAM-RICHARDSON, INC.	18
INLAND CONTAINER CORP.	86
INTERCHEMICAL CORP.	6
INTERNATIONAL PAPER CO.	92
L. R. KERNS CO.	62
KING-SEELEY CORP.	68
LA FRANCE PRECISION CASTING CO.	69
LIGHT METALS CORP.	67
LUX CLOCK CO.	65
MACCO PRODUCTS CO.	56
MARSCO MFG. CO.	13
MEYERCORD CO.	54
MICHIGAN OVEN CO.	84
MILLS PRODUCTS, INC.	83
McLOUTH STEEL CORP.	26
NAGEL-CHASE MFG. CO.	77
NATIONAL LOCK CO.	54
NEW PROCESS D-ENAMELING CORP.	51
NORTHWEST CHEMICAL CO.	78
PEMCO CORP.	52
PENNSALT CHEMICALS CORP.	70 & 71
PITTSBURGH PLATE GLASS CO.	9
PYRAMID MOULDINGS CO.	82
RANSBURG ELECTRO-COATING CORP.	8
REYNOLDS METALS CO., THE	4 & 5
J. O. ROSS ENGINEERING CORP.	80
SELCK, WALTER E.	76
SORENG DIV., CONTROLS CORP. OF AMERICA	4th COVER
SOUTHERN SCREW CO.	20
TENNESSEE COAL & IRON DIV.	79
TITANIUM PIGMENT CORP.	75
TUTTLE & CO., H. W.	64
UNION STEEL PRODUCTS CO.	3rd COVER
UNITED STATES STEEL CORP.	79
UNITED STATES STEEL EXPORT CO.	79
UNIVERSAL SCREW CO.	32
VANANT CO., THE	54
WATKINS CONTAINER MFR'S ASSN.	90
WEIRTON STEEL CO.	10
WHEELING STEEL CO.	15
YOUNGSTOWN SHEET & TUBE CO.	53

Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS

"I saw your ad in MPM"

Scheduling and control

→ *from Page 27*

reach the end of these sub-assembly lines simultaneously as the cooling coil assembly must be matched to the other assemblies in each instance. A unique system of joining the basic sub-assembled units was devised on a separate, shorter conveyor running at right angles to the sub-assembly lines. Matching the control cards insures against mix-up at this point.

The final assembly conveyor runs in the opposite direction from the other three lines and ends at the same general area as the start of the basic sub-assembly lines. All of the trim, glass and lighting are installed on the final assembly line.

One of the factors in the rise of Hussmann Refrigerator Co. to its present position in the commercial food refrigeration field has been the job done by the production control staff. Many other factors must be given credit also, such as aggressive sales, advanced engineering and intelligent management.

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SPECIFICATIONS FOR WHITE APPLIANCE FINISHES by Edward G. Bobalek, Professor of Chemical Engineering, Case Institute of Technology. Four pages — two color. Critical problems in testing discussed, procedures and pitfalls pointed out and explained in this report which is of interest to all organic finish users. 15¢ per copy.

FORMABILITY OF METALS by Lester F. Spencer, Consultant in Metallurgy. Sixteen pages — two color. Covers: basic characteristics of metals, the carbon steels, press operations and roll forming. 25¢ per copy.

A STUDY OF THE CHARACTERISTICS OF ANODIZED ALUMINUM ALLOYS by R. V. Vanden Berg, Aluminum Company of America. Six pages — black and white. Covers a wide variety of surface treatments available for aluminum, and the many finish characteristics. 25¢ per copy.

A REVIEW OF SURFACE TREATMENTS OF METAL by A J. Tuckerman, Bradley Paint Company. Four pages black and white. Covers surface treatments prior to organic finishing, for ferrous and non-ferrous metals. 15¢ per copy.

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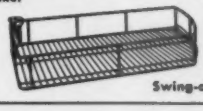
Freezer-Storage Basket



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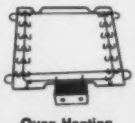
RANGES



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Oven Rack

Oven Rack Side Frame

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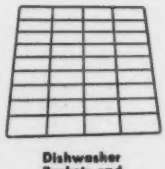

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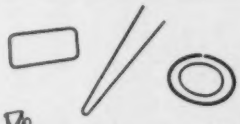

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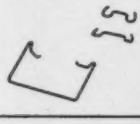
Glass Racks



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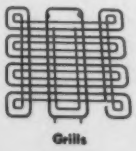

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Wire is an important and functional "part of the product" in every American appliance. Wire is the preferred material because of its engineering, manufacturing and styling versatility, its strength, its lasting beauty and sound dependability. Wire . . . welded in the desired shape and size—plated in the finish required, is basically essential to the appeal, the sale and the continued satisfaction of your appliance.

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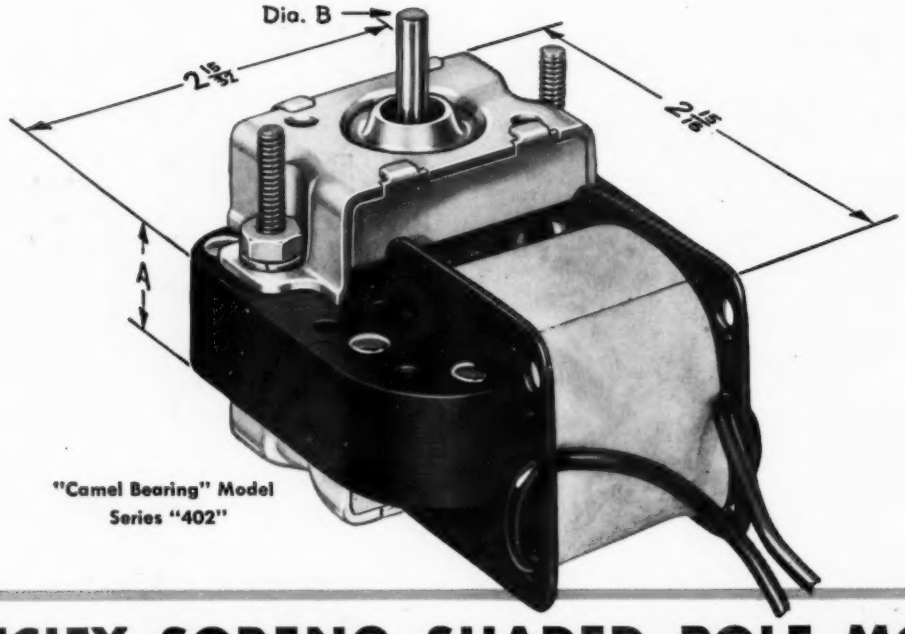

"Camel Bearing" Model
Series "402"

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Where Economical, TROUBLE-FREE Operation is a Must

Series "401"

Series "401" for Standard Life Applications

Here's a tough, durable Shaded-Pole Motor. The "401" has positive aligned bearings with self-aligning features and an open-skeleton frame for effective heat dissipation. You have your choice of 12 models. You'll find a "401" Shaded-Pole Motor that meets your needs exactly.

Series "402" with New CAMEL BEARING Holds Lubricant Thousands of Hours Longer

The "402" Shaded-Pole Motor is built to last. It's a rugged little powerhouse with an EXTRA long life due to its exclusive, new CAMEL BEARING design. This special bearing bracket provides automatic, positive oil circulation even under high temperatures. Oil is constantly feeding into bearing cavities as operating conditions demand.

The "402" is made of high quality, silicon steel. It's versatile, too! The rotor bracket is easily removed so that the motor can be adapted to a variety of field applications. Standard mounting holes make it interchangeable with other motors. Range of 12 models cover all types of applications.

MODEL NO'S (2)	402-10 402-11 401-10 401-11	402-20 402-21 401-20 401-21	402-30 402-31 401-30 401-31	402-40 402-41 401-40 401-41	402-50 402-51 401-50 401-51	402-60 402-61 401-60 401-61
VOLTS	115	115	115	115	115	115
FREQUENCY	60	60	60	60	60	60
AMPERE—NO LOAD	0.31	0.42	0.55	0.64	0.97	1.31
WATTS—NO LOAD	13.5	19	24	27.7	40	53
R P M—NO LOAD	3400	3480	3500	3570	3560	3550
MAX. HP. OUTPUT(1)	1/500	1/200	1/125	1/75	1/50	1/40
START TORQUE OZ. IN	0.58	1.4	2.3	2.3	3.3	4.9
STALLED WATTS	18	29	40	45	68	98
STACK WIDTH "A"	3/4"	5/8"	3/4"	3/4"	1-1/8"	1-1/2"
SHAFT DIA. "B"	0.182	0.182	0.182	0.182	0.2178	0.2178
WEIGHT—POUNDS	0.8	1.2	1.4	1.6	1.9	2.4

SORENG SHADED-POLE MOTORS HAVE OVER 140 PRODUCT APPLICATIONS

Typical Applications include: springwire, gear, chain, rubber belt and friction drives or, to move high velocity, heater or sirocco air.

NOTES:

1. HP RATING AT 3000 RPM—CONTINUOUS DUTY FAN LOAD
2. ALL NUMBERS ENDING IN "0" DENOTE CLOCKWISE SHAFT ROTATION ALL NUMBERS ENDING IN "1" DENOTE COUNTER-CLOCKWISE SHAFT ROTATION
3. 402—LONG LIFE SERIES
4. 401—STANDARD LIFE SERIES
5. LEADS—#20AWGX 7" LONG LEAD WIRE THERMO PLASTIC

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